

**\$40,000
TREASURE
HUNT!
(SEE PAGE 49)**

25 WAYS TO OPTIMIZE WINDOWS

COMPUTE

FEBRUARY 1993

ULTIMATE WINDOWS MACHINE

**TOP EXPERT
PICKS BEST
HARDWARE**

**WAR ON
VIRUSES!**

**25 TOOLS HELP
YOU DO BATTLE**

**SIZZLING
GRAPHICS!**

**10 POWER
PAINT APPS**

PLUS!

**WINDOWS VIDEO
MODEM GAMES
BIZ PLAN BASICS**



0 71486 02193 3

Version 3.1

Version 3.1

Version 3.1

Version 3.1

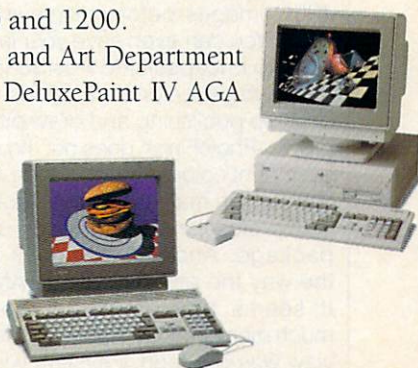
Amiga® 4000 And 1200 Computers Are Priced To Fly.



Watch your computing capabilities soar with the new Amiga® 4000 and 1200.

Save up to \$1,500* on the A4000, including DeluxePaint® IV AGA and Art Department Professional® software. Save up to \$440* on the new A1200, including DeluxePaint IV AGA and Final Copy® 1.3 word processing software.

Both computers feature the Advanced Graphics Architecture™ that lets you display and animate graphics from a palette of 16.8 million colors. You also get a 24-hour Helpline and optional on-site service.** This offer is only good from January 1, 1993 through March 31, 1993. So take off for your Amiga dealer today. Or, call 1-800-66 AMIGA.



Circle Reader Service Number 269

Commodore®
AMIGA®

64/128 VIEW

The future of Gazette depends upon the support of its readers. Also, send us your spreadsheet templates.

Tom Netsel

Now that *RUN* has joined such journals as *Ahoy*, *Commodore*, and *Transactor* in 8-bit heaven, a number of people have written or called asking about Gazette's future. As a matter of fact, I just got off the telephone with one concerned subscriber who called from Australia. I assured him that as long as readers support Gazette with their subscriptions, we'll provide them with information, articles, and programs for the 64 and 128. As a matter of fact, I have plans for something new, but I can't announce it until all the details are worked out.

We have quite a few readers in Australia and around the world, and I'm delighted by their continuing support of Gazette. Like my friend in Australia, subscribers in other countries have to pay about twice the price that U.S. subscribers pay. Postage accounts for much of that extra cost, and they get the magazine a month after the newsstand date. Looking at a subscription card in a recent issue, I see U.S. readers can order 12 issues for \$9.97. (Prices may be higher now.) I see ads on TV for a pizza that costs more! That's less than 85 cents an issue! I hope you'll inform any former *RUN* subscribers about *COMPUTE's* Gazette edition—or the multi-edition which includes 64/128 and Amiga sections for the same price. Pass the word on your local BBS, user group newsletter, or tell your friends in person to send in subscription cards from the magazine or call (800) 727-6937.

As Gazette Disk subscrib-

ers are aware, each month we provide one or two bonus programs that do not appear in the magazine. The December disk included a bonus called SpeedCalc Help. It's a help screen that loads into our popular spreadsheet program.

That started me thinking more about spreadsheets and how useful they can be. I then began wondering about all the ways our readers might be using SpeedCalc. I'm sure many of you have devised interesting and useful spreadsheet applications. How about sharing them with other 64 and 128 users? These files or spreadsheet templates might be stock analyzers, grade books, home budgets, conversion programs, or any useful application.

Send us a disk with a copy of your spreadsheet template that will load into SpeedCalc (or GemCalc, a compatible spreadsheet available on the Gazette PowerPak Disk). We'll publish a number of them as bonuses on future Gazette Disks. We'll pay \$100 for each program we use. A simple budget is provided on this month's disk as an example. Be sure to include enough instructions within the program itself. It must be a single self-explanatory program that users can load into their spreadsheets, filling in the blanks with their own data.

Send your templates—for SpeedCalc or GemCalc only—to SpeedCalc, *COMPUTE's* Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. Sorry, but no disks will be returned. □

GAZETTE

64/128 VIEW

G-1

Gazette's future depends upon the support of its readers. Also, a call for spreadsheet templates. By Tom Netsel.

BAUDS MEAN BUCKS

G-3

Get the most information for the least amount of money when you go online with commercial services. By Ranjan Bose.

REVIEWS

G-8

Fastoffice medical software and *dieHard* magazine.

FEEDBACK

G-15

Questions, answers, and comments.

BEGINNER BASIC

G-16

Put the WAIT statement to work. By Larry Cotton.

MACHINE LANGUAGE

G-18

Don't bog down your interrupts with slow code. By Jim Butterfield.

PROGRAMMER'S PAGE

G-20

Here are more great programming tips from readers. By Randy Thompson.

GEOS

G-22

If you're a GEOS fan, you can't afford to pass up all the great programs on QuantumLink. By Steve Vander Ark.

D'IVERIONS

G-24

Are you sure that warm, friendly voice you hear on the telephone belongs to a human being? By Fred D'Ignazio.

PROGRAMS

Rogue Sunbathers (64)	G-25
Space Trek (64)	G-28
Push Button 64	G-30
EZ-Loader (64)	G-34
Stock Analysis 128	G-36
The Automatic Proofreader (64/128)	G-40

GAZETTE DISK LIBRARY

VALUE-PACKED SOFTWARE AT AFFORDABLE PRICES

All Gazette disks are menu-driven for ease of use—and they feature complete documentation. Just load and you're ready to go!

SpeedScript

\$11.95

COMPUTE Publications' most popular program ever. Powerful word processing package includes *SpeedScript* for the 64, *SpeedScript 128*, spelling checkers for both 64 and 128 versions, plus an additional dozen support programs, including mail-merge and word-count utilities.

Gazette Index

\$7.95

Every article and department from *Gazette*—July 1983 through December 1989 issues—is indexed: features, games, reviews, programming, "Bug-Swatter," "Feedback," and the other columns. Disk features pull-down menus, help screens, superfast searching/sorting capabilities, and much more.

Best Gazette Games

\$9.95

Best dozen arcade and strategy games ever published in *Gazette* all on one disk. All games for Commodore 64. Titles: *Crossroads II: Pandemonium*, *Basketball Sam & Ed*, *Delta War*, *Heat Seeker*, *Omicron*, *Powerball*, *Q-Bird*, *Trap*, *Arcade Volleyball*, *Mosaic*, *Power Poker*, and *Scorpion II*.

Gazette's Power Tools

\$9.95

Fourteen of the most important utilities for the 64 ever published in *Gazette*. For serious users. Titles: *MetaBASIC*, *Disk Rapid Transit*, *Mob Maker*, *Ultrafont+*, *Quick!*, *Disk Editor*, *Basically Music*, *PrintScreen*, *1526 PrintScreen*, *Fast Assembler*, *Smart Disassembler*, *Comparator*, *Sprint II*, and *Turbo Format*.

The GEOS Collection

\$11.95

Gazette's best 13 programs for GEOS and GEOS 128 users. Selection includes utilities, applications, and games. Titles: *Super Printer Driver*, *Skeet*, *File Saver*, *Help Pad*, *Word Count*, *Directory Printer*, *Quick Clock*, *SlideShow*, *File Retriever*, *Screen Dumper*, *Font Grabber*, *GeoPuzzle*, and *GeoConverter*.

128 Classics

\$11.95

Thirteen of *Gazette's* best 128 programs, including utilities, games, and applications. Titles: *MetaBASIC 128*, *RAMDisk 128*, *80-Column Disk Sector Editor*, *MultiSort*, *Block Out*, *Miami Ice*, *The Animals' Show*, *Cribbage*, *XPressCard*, *Sound Designer*, *Video Slide Show*, *Math Graphics*, and *3-D BarGrapher*.

SPECIAL OFFER!

All 6 DISKS FOR ONLY \$49.95!

A \$13.00 SAVINGS!

All prices include shipping & handling.

SpeedScript	☐ \$11.95
Gazette Index	☐ \$ 7.95
Best Gazette Games	☐ \$ 9.95
Gazette's Power Tools	☐ \$ 9.95
The GEOS Collection	☐ \$11.95
128 Classics	☐ \$11.95
Special 6-Disk Offer	☐ \$49.95

Subtotal _____

Tax* _____

Outside U.S. or Canada** _____

Total _____

Name _____

Address _____

City _____ State _____ ZIP _____

Amount enclosed \$ _____ Method of payment ☐ Check or Money Order
☐ VISA or MasterCard

Mail to Gazette Disks
324 W. Wendover Ave., Ste. 200
Greensboro, NC 27408

Credit card no. _____ Exp. date _____

Signature (required) _____

Daytime phone number _____

* Residents of North Carolina and New York add appropriate sales tax. Canadian orders, add 7% goods and services tax.

** For delivery outside the U.S. or Canada, add \$1 for surface mail or \$3 for airmail. All orders must be in U.S. funds drawn on a U.S. bank.

Telecommunications is the magical process by which distant computers communicate with each other via telephone lines. For those just getting their feet wet in the sea of telecommunications, a primary concern is the speed at which modems communicate.

A modem is a device that converts (modulates) digital signals from a computer into audio tones that can be transmitted over phone lines. Another modem at the other end converts the tones back into their original digital form (demodulates). Transmission speed is measured in the number of bits sent per second (bps). Although a byte that represents one character contains eight bits, a usual telecommunication byte is ten bits long. It consists of eight bits for the information or data and two delimiting bits that separate contiguous data bytes.

Theoretically speaking, a 300-bps modem can send 30 characters per second. A typical double-spaced typed page of 1800 characters and spaces would need about a minute if transmitted at 300 bps. A modem operating at 2400 bps can send the same page in 7.5 seconds!

A 64's commonly used modem speeds of 300, 1200, and 2400 bps are in a sense analogous to the XT, AT, and 386 technologies familiar to PC users. XTs

BAUDS MEAN BUCKS

**Time is money
when you connect to
commercial
information services.**

By Ranjan Bose

are inexpensive and adequate for some uses, but they're slow. The AT is more efficient yet inexpensive, but it's neither here nor there—similar to 1200-bps modems. The 386s are fast, very well supported, and available at reasonable cost—as are 2400-bps modems. To carry the analogy further, the new super-

speed modems would be comparable to 486s.

Slower modems are the least expensive ones to buy, but they can cost you money if you use them on commercial online services. To give you an example of the savings you can achieve with a higher-speed modem, let's assume that an online service charges \$6.00 an hour for 300-bps access

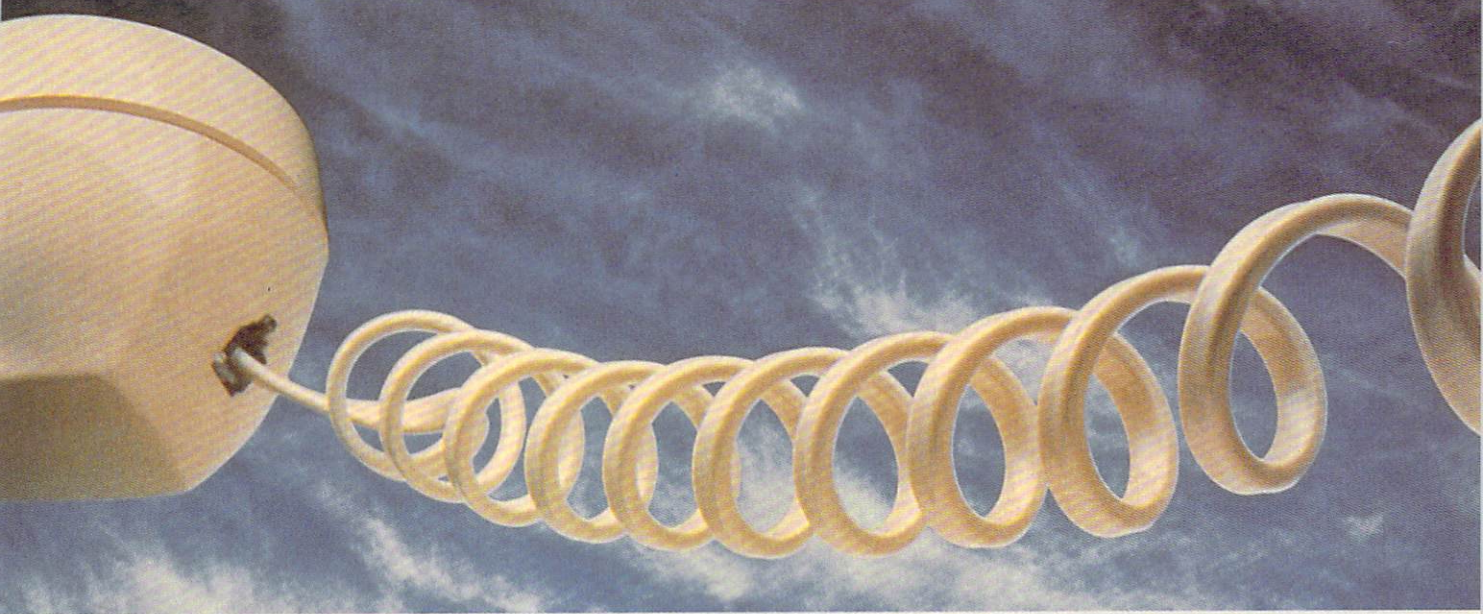
and \$12.50 an hour for 1200- or 2400-bps access. If you were to access the service for an average of ten hours every month, you would be paying \$60.00 for 300-bps access and \$125.00 for 1200- or 2400-bps access. If you spend most of your online time downloading files or messages (and not chatting in forums), you could download four times as much at 1200 bps and eight times as much at 2400 bps as you could at 300 bps—for just over twice as much money.

This ideal scenario is obviously subject to several variables, such as the condi-

tion of the phone connection, the network load (ensuring error-free transmission), and the presence of either a DOS speed-up utility in your system or the ability to use an REU as a RAM disk.

If we consider the amount of data transferred at 300 bps over ten hours as an arbitrary data unit, each data unit at the above prices would cost \$60.00 at 300 bps, \$31.25 at 1200 bps, and \$15.63 at 2400 bps. For a little more than the difference in the cost of accessing our arbitrary data unit at 300 bps as compared to 2400 bps, you can buy a 2400-bps modem.

Also, while a PC user cannot buy an XT/AT/386 combo, a 2400-bps modem will let you telecommunicate at all three speeds when necessary. If a BBS you call operates at a slower speed, your 2400-bps modem can slow down. You could use 300 bps when chatting online or typing messages, or anything else that involves online waiting or keyboard entry. Then use 2400 bps when transferring files. The 1200-bps or slower speeds can come in handy for those occasions when a phone line is noisy.



Data transmission is less subject to error on noisy phone lines when transmitted at slower speeds.

In Praise of Speed

I cannot help but toot the 64's horn at this point. Electronic eons ago when 300 bps was the 64's telecommunication standard, people thought that reliable data transfer at 1200 bps and higher speeds was impossible because of idiosyncrasies in the Commodore Kernal routines. At any rate, 1200 bps became a reality, fought the gremlins, and is now aging gracefully.

There may not be as many 64 users telecommunicating at 2400 bps, but those who do are quite happy. With 2400-bps external modems selling for well under \$100, you need not shy away from using them because of price. Several commercial and shareware terminal programs exist which support 2400-bps access. NovaTerm, Terminal One, and Bell Term are just a few of them.

RS-232 Devices

Commodore decided on a different type of interface for its user port, rather than going with the industry standard RS-232. Therefore, connecting an RS-232 device, such as a modem, to a 64 used to be a problem. That's no longer the case. Aprotek makes a fine product called Com-Modem, which works well with external RS-232 modems. Several other RS-232 interfaces which plug into the 64's user port are also available from Aprotek, Creative Micro Designs, and other companies. Aprotek also sells a 2400-bps modem that plugs directly into the user port.

RS-232 modems supporting 2400 bps come in two varieties, a plain-vanilla modem which allows 300-bps to 2400-bps speeds and one which offers built-in protocols for error checking and data compression (MNP, V.42bis). These latter ones are great toll savers, but only if the modem at the other end also uses them.

Expedient or Exotic

CompuServe users, for instance, would not be able to use MNP5 or V.42bis because the online service does not yet support these protocols. CompuServe may eventually add these protocols, but a plain-vanilla 2400-bps modem is sufficient for several reasons. To a significant extent, a well-engineered modem can compensate for occasional line noise using adaptive equalization, line impedance

Time of day	Download time in seconds				Cost per 10K bytes
	#1	#2	#3	Mean	
8:00 a.m.	45.36	29.33	30.33	35.01	\$1.19
11:00 a.m.	33.09	39.51	33.29	35.30	\$1.20
10:00 p.m.	19.42	19.98	19.17	19.52	\$0.66
6:00 a.m.	16.93	17.40	18.95	17.76	\$0.60

matching, and other techniques.

To use MNP5 and V.42bis protocols effectively, your software should support 4800 or 9600 bps, neither of which is supported by any 64 telecommunication software. NovaTerm with the CMD Swiftlink is a combination of software and hardware that claims to do this. MNP protocols are very useful during ASCII (text) transfers, but their advantages vanish when transferring programs (binary) or files that are already compressed, such as ARC or LYNX.

Finally, these protocols interact variably with software error-checking protocols such as XMODEM and YMODEM. These software protocols are usually self-sufficient anyway. MNP and similar protocols are more

useful for transferring numerical business data where glitches could result in financial disaster. So instead of waiting for these sophisticated protocols and modems that can use them, go for it! The longer you postpone getting a 2400-bps modem, the more money you're losing online.

You may see an occasional garbled character in messages or bulletins that have been sent at 2400 bps, but you can easily correct them by using your parallel processing, multigigabyte supercomputer known as your brain.

Rush-Hour Blues

If you've ever used an online service, you may have noticed its slowing down at times. When large numbers of users are online simultaneously, the effective transmission of bits and bytes through the phone network becomes appreciably slower than that occurring during nonpeak hours. The delay is especially noticeable when using packet switching networks such as Tymnet or Datapac. For top-dollar values, try to download large files during nonpeak hours, usually early morning or very late at night. If you're calling from Japan, be aware of the time difference. You may stay up late only to run into bright-eyed, well-rested U.S. users—thousands of them!

Time Is Money

I recently ran a simple experiment in which I downloaded a certain file from CompuServe at different times of the day, with XMODEM at 1200 bps (using the Common Sense 1200 terminal program that is bundled with the Commodore 1670 modem). I downloaded each file three times during each online session. A digital chronometer allowed me to time the transfer of eight XMODEM blocks (1048 bytes). To rule out varying disk transfer delays, I always downloaded to a freshly formatted disk. Boy, was I surprised!

Note that the variations in rates of transfer between similar samples 1, 2, and 3 is less during the nonpeak hours. (See the above table.)

Are MNP Modems Necessary?

While shopping for modems capable of transmitting at 2400 bps, you come across many with choices such as MNP (Microcom Network Protocols) and V.42bis protocols. These modems can check and correct for errors during transmission arising from phone line noise and other interferences. They can compress data so that you get an effective transfer rate of 4800-9600 bps.

To be effective, however, the modem at the other end must also be an MNP or V.42bis type. You must also remember that most downloadable files are already compressed and do not benefit much from these procedures. Protocols which enable an apparently higher speed transmission (MNP5) cannot be used with a 64 because none of the terminal software allows for speeds greater than 2400 bps.

Finally, during downloading, you usually employ software-based error checking protocols such as XMODEM or Punter. So save your money. A plain-vanilla 2400-bps modem will suffice for most of your telecommunication purposes.

These transfer rates are not cast in stone and do vary somewhat depending on many factors, but they illustrate the point that the time of day does make a significant difference in telecommunication costs. During the day and in the early evening, there are longer delays and more errors (requiring repeated transmissions of blocks of data), possibly because of higher line noise and longer switching delays as a consequence of heavier usage.

Can Software Help?

If you examine the above values closely, you will observe that even at the best transfer rate of 1048 bytes in 17.76 seconds, only 59 bytes were getting transferred each second ($1048/17.76=59$). Since I was operating at 1200 bps, in theory, the transfer rate should have been 120 bytes per second. (Each telecommunication byte is ten bits long: eight bits for the data and two delimiter bits.) You cannot expect 100-percent efficiency in the real world, but I was getting less than 50 percent. Something was not right!

I wondered if my telecommunication program was using inefficient code. In order to figure that out, I fired up my computer and downloaded a certain file by first using Common

Why Use 2400?

If you access CompuServe at 300 bps, it costs \$6.00 an hour, whereas at 1200 or 2400 bps, the cost is \$12.50 an hour. The volume of data which can be sent at 300 bps, under ideal conditions, would cost approximately half as much at 1200 bps and one-fourth as much at 2400 bps. Over a short period of time, you could easily recoup the cost of the modem by stepping up from 300 to 2400 bps.

The savings are even more relevant for those who don't have local CompuServe nodes and must use Datapac or other packet switching

networks which charge \$10.50 per hour above regular CompuServe connect fees.

Higher speeds save you money when you're downloading files and programs, but at other times you may prefer a slower rate. In situations which involve online waiting, such as chats or conferences, 300 bps can be your best bet. Most 2400-bps modems also support 300 bps, so there's no need to have both.

So to answer the question of why we need 2400-bps modems, Scrooge says it best: "Money, money, money!"

Going one step further, I tried similar transfers using NovaTerm at 2400 bps. To my dismay, I found that when using a packet switching network such as Datapac, downloading with XMODEM was only a little faster at 2400 bps—not 100 percent faster as I had expected.

Reading Text

Does this mean that a 2400-bps modem is not really a big toll saver? Quite the contrary, since most of the online time is spent in ASCII transfers,

complex process. Gremlins such as network delays, disk drive delays, phone line noise, and other errors all contribute toward reducing the actual transfer of data.

Since all modem speeds are likely to be affected proportionately by these factors, a 2400-bps modem still represents a good investment if you do a fair amount of telecommunicating. This is especially true if you access online information networks or call BBSs in distant cities.

Maximum Efficiency

If you simply send data via phone line to another computer, you have no way of knowing whether that information arrives correctly or not. Noise and static on the line could alter the bits and bytes, garbling the data. To help insure error-free transmissions, most terminal programs utilize some form of error-checking technique called a protocol.

There are basically three kinds of software protocols used when uploading or downloading files. XMODEM is an example of a protocol which transfers small blocks (131 bytes) of data at a time. Another type, which includes XMODEM 1K and YMODEM, transfers a bigger block (1024 bytes). A third kind of protocol uses blocks of variable sizes. Examples of the third type are Punter and Kermit.

All of these protocols employ some form of checksum comparison between the sending and receiving computers. If an error is detected, the block is retransmitted. Even if only one error is detected, the computer must send that whole block of data.

If the phone line connecting the computers is clean and requires a small number of retransmissions, then protocols that support larger blocks are more efficient. If a lot of errors

	XMODEM 1200 bps		XMODEM 2400 bps	
	Datapac	CompuServe	Datapac	CompuServe
DL time	31.19	13.94	19.30	8.75
Bytes/sec	34	75	54	120
Efficiency	8.3%	62.5%	22.5%	50%

	YMODEM 1200 bps		YMODEM 2400 bps	
	Datapac	CompuServe	Datapac	CompuServe
DL time	12.08	10.64	11.83	6.09
Bytes/sec	85	96	87	168
Efficiency	70.8%	80%	36.2%	70%

Sense 1200 and immediately afterward using NovaTerm 9.3 (distributed by Aprotek). Since Common Sense 1200 doesn't support 2400 bps, the time in seconds required for downloading 1048 bytes at 1200 bps was measured for both programs. I ran and timed this test five times for each program.

With Common Sense 1200, the mean value of five downloads was 32.7 seconds, with the fastest transfer 27.54 seconds. With NovaTerm 9.3, the mean value for five downloads was 23.1 seconds, with the fastest value 20.15 seconds.

NovaTerm, therefore, proved to be 30 percent faster than Common Sense 1200 for XMODEM transfers under nearly identical conditions.

such as chatting or reading messages and bulletins. I decided to test this activity by reading text files instead of downloading them.

To do this, I called CompuServe and let data flow in as fast as it could. To avoid drive-induced delays, I used the buffer RAM disk that NovaTerm supports. I closed the buffer at 30 seconds. At 1200 bps, I managed to receive 3511 characters (117 characters per second). When I switched to 2400 bps, I received 7059 characters (235 cps) in 30 seconds. This is close to the theoretical limits of 120 and 240 characters per second for the two modem speeds.

Compared to straight ASCII transfers, protocol-controlled downloading is obviously a more demanding and

occur during transmission, then a protocol using smaller blocks gains an upper hand because it has to resend only 131 bytes instead of 1024. One YMODEM retransmission could, in theory, equal seven or eight retransmissions via XMODEM.

X or Y?

So is YMODEM really more efficient than XMODEM? Are transmissions affected by the network you use, such as a dedicated network versus a packet switching network?

To test these variables, I accessed CompuServe from my home in Canada through Datapac, which is a 128-byte packet switching network similar to Telenet and Tymnet, and by directly calling the dedicated CompuServe node in Toronto. The following table indicates the results of my test.

The DL time is the mean value in seconds to download either 1048 (XMODEM) or 1024 (YMODEM) bytes from CompuServe at 1200 and 2400 bps using the popular telecommunication program NovaTerm 9.3.

With clean phone lines, no errors occurred during these transmissions. The delays were primarily due to the way the data packets were handled by the networks. Bytes/sec indicates

the number of bytes downloaded per second. The efficiency figures represent the actual performance compared to the modem's theoretical maximum transfer rates of 120 and 240 bytes per second.

Several interesting things became obvious. Calling a CompuServe node directly resulted in more efficient transfers, although on those occasions when Datapac was working at its peak efficiency, it was almost at par with the CompuServe node.

If you compare the bytes-per-second transfer rates obtained at the two speeds in the Datapac columns, 2400 bps was faster than 1200 bps by 2-59 percent. XMODEM showed more improvement than YMODEM, but it was still lower than YMODEM in the total number of bytes transferred.

Looking at similar values, when CompuServe was accessed directly, we discover that 2400 bps was faster than 1200 bps by 60-75 percent. YMODEM was always more efficient than XMODEM.

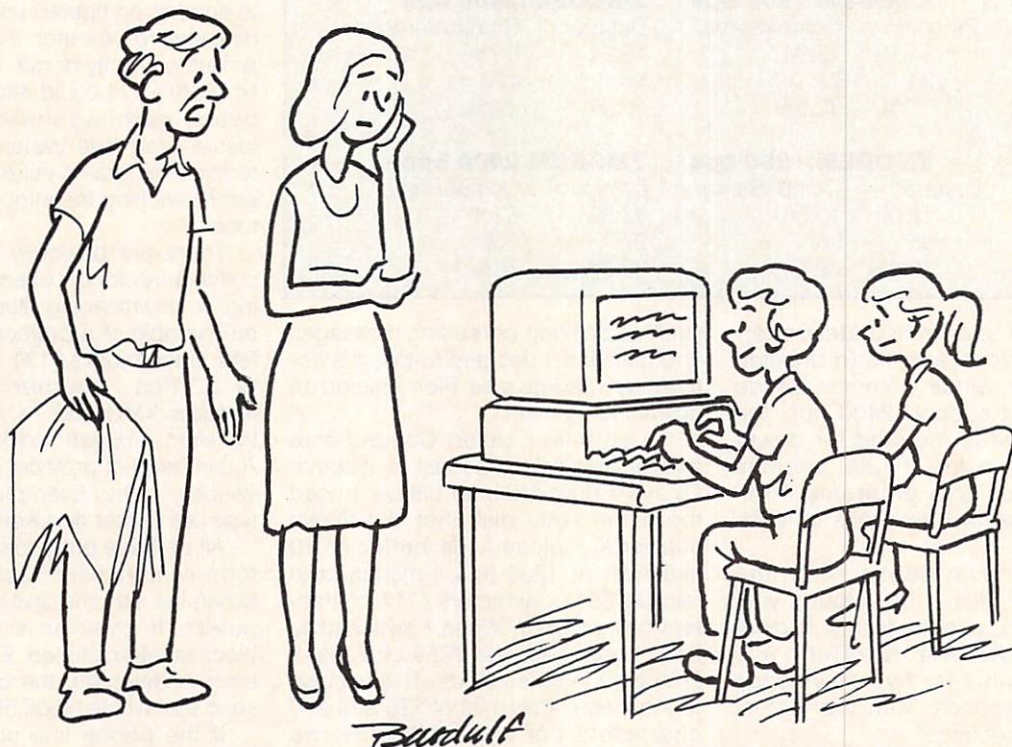
Assuming the theoretical 100-percent efficiency of transfer to be 120 bytes per second at 1200 bps and 240 bytes per second at 2400 bps, the actual performances observed for XMODEM ranged from 23-63 percent,

while performances for YMODEM ranged from 36-80 percent.

The Bottom Line

Just a few short years ago, the price of a 1200-bps modem was several hundred dollars, and 2400-bps modems were even higher. When a modem could cost more than a computer, most users made do with 300-bps. Now that 1200- and 2400-bps modems are less than \$100, frugal users still want to cut costs where they can. When you're connected to an information network that charges by the minute, connect time is the obvious place to trim.

In conclusion, while accessing services which charge the same amount per hour for 1200- or 2400-bps access, it's more efficient to use the faster speed, coupled with YMODEM. Moreover, it's better to connect with the service through a dedicated node, rather than through a packet switching network, even if it means calling long-distance. And if you're willing to work between 12:00 a.m. and 7:00 a.m., the long-distance charges are usually lower, and the phone connections usually cleaner, further reducing your telecommunication costs. □



"For heaven's sake, don't tell them it's educational."

143 Western
Designs for
Print Shop,
FGM, and
Compatible
Programs
for the
C64/128
Commodore
Computers

WESTERN HERITAGE

\$24.95

plus \$/H
US \$4.00
Canada \$6.00
AK, HI \$6.00
APO, FPO \$6.00
WA Res Tax \$1.92

We take Visa or
Master Card
509-276-6928

WESTERN HERITAGE

Graphics, Borders, and Fonts for the Print Shop.



HORSE FEATHERS
GRAPHICS

Version for the Commodore 64 Includes 9 Pin and 7 Pin Printers.

Requires
Print Shop
or
Print Shop V1
& Companion
or
Print Shop V1 &
Holiday Edition

NOW uses
the same
printer as
your
Print Shop
Side A or
Side B



Print Shop,
Companion, and
Holiday Edition
are Trademarks of
Broderbund
Software Inc.

Create a Total Western Environment with 143 designs
90 Graphics, 42 Borders and 11 Fonts for the Print Shop.

- All New Western Designs by Professional Artists.
- Instructions to make 10 Gunfighters of the Old West, Wanted Posters.
- Authentic Indian Symbols Font, designed for secret messages.
- Matching Fonts, Borders, and Graphics, for a Professional look.
- Comes in a Beautiful Collectors Notebook, to Organize your Creations.
- Old Ranch Brands, Wagons, Horse Shoes, Cattle, English Riders, Gunfighters, Indians, Cowboys, Ropes, Hats, Boots, Saddles, and more.



Horse Feathers Graphics, N. 27310 Short Road, Deer Park, WA. 99006-9712

Circle Reader Service Number 234

Bible Search 3.2

1. The entire Old & New Testament text on 4-1541/71 disks.
2. An Exhaustive English Concordance on 2-1541/71 disks.
Indexes every word in the entire Bible; 700,000+ references.
3. Incredible five (5) second look-up time, per/word, per/disk.
4. Instant, automatic spell checking of more than 12,800 words.
5. Wildcard and boolean AND, OR & NOT search options.
6. Search the entire Bible in 5 seconds with 1581 or HD (v 3.52).
7. Money back guaranteed!

KJV \$49.95 | NIV \$59.95 | KJV & NIV \$90

Includes: C64 & C128 programs; screen, printer and disk output; users guide, disk case. Available on 7-1541/71, or 4-1581 disks.

Any questions? Call or write for more information.

Also available! Amiga, Bible Search

New

Big Blue Reader 128/64 - 4.0

Transfers word processing, text, ASCII, and binary files between C64/128 and IBM PC compatible 360K 5.25" and 720K 3.5" disks.

New Version 4.0 features: Transfers ASCII, PET ASCII and Screen Code files including: WordWriter, PocketWriter, SpeedScript, PaperClip, WriteStuff, GEOS, EasyScript, Fleet System and most others.

Supports drives # 8-30. New Backup (C128) and Format (1571/1581) programs. Reads MS-DOS sub-directories, uses joystick, and more.

Includes C128 & C64 programs. Requires 1571 or 1581 Disk Drive.

Big Blue Reader 128/64 - 4.0 only \$44.95

Version 4.0 upgrade, send original BBR disk plus \$18.

Order by check, money order, or COD. US funds only.

FREE book rate shipping in US. No Credit Card orders.

Canada & Mexico add \$4 S/H, Overseas add \$10 S/H (\$5 BBR)
SOGWAP Software (219)724-3900

115 Belmont Road; Decatur, Indiana 46733

SAVE TIME AND MONEY

Yes, save time and money! Subscribe to the *Gazette Disk* and get all the exciting, fun-filled *Gazette* programs for your Commodore 64 or 128—already on disk!

Subscribe today, and month after month you'll get all the latest, most challenging, and fascinating programs published in the corresponding issue of *COMPUTE*.

New on the *Gazette Disk*! In addition to the programs that appear in the magazine, you'll also get outstanding bonus programs. These programs, which are often too large to offer as type-ins, are available only on disk—they appear nowhere else.

As another *Gazette Disk* extra, check out

"Gazette Gallery," where each month we present the very best in original 64 and 128 artwork.

So don't waste another moment. Subscribe today to *COMPUTE's Gazette Disk* and get 12 issues for only \$49.95. You save almost 60% off the single-issue price. Clip or photocopy and mail completed coupon today.

Individual issues of the disk are available for \$9.95 (plus \$2.00 shipping and handling) by writing to *COMPUTE*, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

YES! Start my one-year subscription to *COMPUTE's Gazette Disk* right away for only \$49.95.*

☐ Payment enclosed (check or money order)

☐ Charge ☐ MasterCard ☐ Visa

Acct. No. _____ Exp. Date _____

Signature _____

(Required)

Name _____

Address _____

City _____

State/Province _____ ZIP/Postal Code _____

Mail to *COMPUTE's Gazette Disk*, P.O. Box 3250, Harlan, IA 51593-2430

*Residents of NC and NY, please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.

FASTOFFICE

Most people consider the 64 to be a personal computer that's used mainly at home, but it's found its way into many offices as well. Word processing is undoubtedly its biggest use, but it's capable of much more.

Spreadsheets and databases are powerful and flexible programs that users can adapt to any number of office activities. They can be used for budgets, inventory control, managing customer lists, and dozens of other uses, depending on the skill and needs of their users.

Most of the commercial business applications have been designed for flexibility. Rather than targeting one specific business or performing one specific task, these programs are tailored to satisfy a variety of commercial needs. This flexibility enables the software to appeal to a wide audience, which in turn makes for sizable sales and profits for the software companies. When software is customized for one business, it can no longer appeal to a wide audience. As a result, its price normally jumps dramatically.

Fastoffice is such a piece of software, but it bucks the norm. It is designed for billing and practice analysis for physicians. To narrow its scope even more, it's designed for solo practitioners. Price is where Fastoffice differs from most customized software. To make a profit selling to a small number of physicians, most billing software costs thousands of dollars. Fastoffice costs \$50!

Fastoffice doesn't pretend to compete with full-featured billing and practice analysis programs, but it does handle a number of billing chores. And it does

them well. It was written by an ophthalmologist for his practice, and he's been using it for more than five years.

Fastoffice is menu driven and fairly simple to use. A physician who is used to billing patients, sending claims to insurance companies, and writing off certain amounts would probably have no difficulty using the program. That's probably why the review copy I received came with no documentation—just a few words of explanation in an accompanying letter.

From the opening menu, you have the option to view, print, or modify a record; create a new record; print bills; or move to another menu. I knew from the letter that I would need a separate data disk. By selecting another menu, I found the system utilities that let me format that disk. That menu also offers the options to compress or unpack data disks using a dual-drive system.

Once your data disk is ready, you can create new records. This is where you fill in a patient's name, address, insurance carrier, billing code, and billing history. Four lines allow you to enter procedures and fees. I discovered that payments can be entered in this area by placing a minus sign in front of the amount. Once basic information has been recorded, you can then enter another new patient or return to the menu.

After the basic information has been entered, you can print the patient's bill. One drawback that I noticed here is that while the program prints the patient's name and address, it doesn't print the physician's. That form of the bill might be sufficient to hand to a pa-

tient in the office; otherwise, I'd recommend using pre-printed billing statements.

Once you have a patient on record, you can then view or modify any information simply by entering the patient's last name. If more than one person with that name is in your data, the program tells you how many matches it's found and asks which patient you want. From there, you can delete a record, alter any line, return to the main menu, or move to another menu.

This other menu lets you print a bill or summarize the billing notes. A bill has space for four itemized lines of procedures and/or payments. You can summarize this data and bring the balance forward at any time. The balance then appears on the top line, freeing three lines for additional information regarding procedures and/or payments.

In many cases a physician's fee is paid in part by an insurance company with another portion billed to the patient. Depending on the circumstances, some portions of the fee must be written off. Fastoffice enables the physician to keep track of these write-offs. With a patient's bill on the screen, you have the option to convert to write-off format. You are presented with the patient's charges and asked if this amount is billable. If not, you can enter the billable portions and any insurance payments. The amount the patient owes is then presented as the new balance. The program then computes the write-off percentage and prints an updated bill.

Another menu lets you browse through each of the records, making any changes or printing them out. You can also view any write-offs.

This option prints the patient info with the amount and percent that has been written off. A summary prints the number of write-offs and the total percentage and dollar amount of the write-offs. A practice analysis prints an active account summary, listing the number of patients, the total amount receivable, and the percentage of patients covered by each insurance carrier. You can also see how much business is represented by each insurance company. Fastoffice computes the percentage owed to you by all the patients handled by a particular carrier.

Make sure your printer is on before you try to print bills or analyze your practice. Fastoffice crashes if it tries to print and your printer is turned off. One of its good points, though, is that it recognizes any files left open prior to a crash. It lets you close them properly when you reboot, saving any data that might have been jeopardized.

More and more physicians are turning to computers to handle their billing, and it's not uncommon for them to spend more than \$10,000 for software. I don't think Fastoffice will replace the heavy-duty systems that store CPT or ICD9 codes, fee schedules, referring physicians, and patient birthdays, but it certainly does offer a lot for \$50.

The program is easy to operate, but a page or two of documentation would help explain some of the program's finer points. I don't think that would boost its price too much. Perhaps if more physicians used Fastoffice on a 64, they could save on computer costs. Then perhaps they could pass the savings on to their

SOFTWARE SUPPORT INTERNATIONAL

C-64/128 Specialists For Over Five Years

*Thousands of Commodore Owners Choose Us
As Their One Stop Supplier. Here's Why!*

* Great Selection of Front Line Software.

We stock most major Commodore titles that are still in Production.

* Hardware & Peripherals.

Although we can't get keyboards and disk drives any longer, we can offer disks, modems, cables, interfaces, and much more.

* Closeouts & Bargains.

We're constantly seeking out those hard to get gems, and offering them at prices that would make Scrooge grin.

* Used Software Trade In Program.

A Software Support exclusive. It takes a bit of extra work, but we don't mind. Another commitment to personalized service.

* Un-Advertised Specials.

Our regular customers enjoy VIP service and great bargains that are hard to pass up.

* Expert Technical Support.

As a regular Software Support customer, you have access to the most knowledgeable Commodore technical departments in the country. Of this, we're darn proud.

* Friendly & Courteous Order Takers.

You'll have a hard time finding order takers as anxious to help you as Sandy, Ann and Connie.

* Fast Order Processing.

Thanks to our automated computer system, huge inventory and efficient shipping staff, most orders are processed the same day.

* Walk In Sales Department.

We welcome visitors to our warehouse outlet. The same great deals are available and best of all, no shipping charges.

* Worldwide Distributor Of Major Products.

Ever hear of Maverick, Super Snapshot, Super 1750 Clone, and the 1581 Toolkit? We've been actively involved in the ground up production and world-wide distribution of these and many other fine Commodore products.

* Purchase From Us With Confidence.

We were very pleased when the Better Business Bureau came to us and told us that our outstanding reputation qualified us as members in their organization. We're here to stay, not a fly by night, here today and gone tomorrow outfit.

* Extensive Catalog.

Our contacts at other mail order companies have told us that producing a catalog such as ours is too time consuming and worst of all - too expensive. We say it's the least we can do for our customers, and wouldn't have it any other way. Simply call or write for your free copy.



Check Out These Examples...



GAMES

Tony LaRossa Baseball	\$9.97
Bard's Tale 3	\$12.97
Blackjack Academy	\$9.97
Cutthroats	\$6.97
Test Drive 2	\$12.97
California Challenge	\$6.97
European Challenge	\$6.97
Muscle Cars	\$6.97
Super Cars	\$6.97
Jack Nicklaus Golf	\$12.97
J.N. Courses 1,2 or 3	\$6.97
TV Sports Football	\$9.97
Batman(Arcade Ver)	\$9.97
Batman(Movie Ver)	\$9.97
Solo Flight	\$9.97
Suspect	\$6.97
Shoot'Em Up Const.	\$9.97
Terror	\$6.97

EDUCATIONAL

Carmen Europe	\$26.97
Carmen World	\$24.97
Carmen Time	\$26.97
Carmen USA	\$26.97
Mavis Beacon Typing	\$27.97
Donald's Alphabet	\$9.97
Sky Travel	\$19.97
Perfect Score SAT	\$9.97
Songwriter	\$9.97

PRODUCTIVITY

Super 1750 Clone	\$99.95
Dome Accounting	\$37.97
Create A Calendar	\$19.97
Fleet System 2	\$12.97
Graphic Label Wizard	\$14.97
Home Designer 128	\$24.97
C-128 Graphics Pack	\$29.97
Mastertype/Writer	\$12.97
Printshop	\$29.97
Paperclip 3	\$29.97
Paperclip Publisher	\$29.97

Items Listed Above Do Not Include Shipping. Call Or Write For Your Free Catalog Listing Hundreds Of Products And Special Offers For Your Computer. Our Order Takers Are On Duty 6:00 a.m. - 5:00 p.m. M - F and 7:00 a.m. - 3:00 p.m. Sat. - Pacific Time.

**SOFTWARE
SUPPORT**

Software Support Int.
2700 N.E. Andresen Rd.
Suite A-10
Vancouver, Wa 98661
(206) 695-1393

CALL TOLL FREE TODAY!

1-800-356-1179

Major Credit Cards Accepted.

C64/128 PUBLIC DOMAIN SOFTWARE

REQUEST FREE CATALOG or send \$2 for sample disk and catalog (RE-FUNDABLE). Categories include education, utilities, games, business, PRINT SHOP graphics, pre-tested programs and more. Rent for 75¢ or buy as low as \$1.00 per disk side or for 80¢ for 70 or more. \$20 order gets 4 free disks of your choice.

NEXT DAY SHIPPING!

SINCE 1986



CALOKE INDUSTRIES (Dept. GK)
PO BOX 18477, RAYTOWN, MO 64133



Circle Reader Service Number 181

CEE-64
ALIVE!

DISK MAGAZINES FOR 64 & 128

Great Programs & Articles From Both Sides of the Atlantic!
C64 ALIVE! is U.S. produced. LIGHT DISK and clubLIGHT are UK produced.
C64 ALIVE! Sample disk \$3: 5 issues ending 12/92 \$20; 6 issues starting 1/93 \$25
clubLIGHT Single issue \$5
LIGHT DISK (only 4 issues) 8 Disks \$30
LIGHT DISK and clubLIGHT are for 64/128 — C64 ALIVE! is 64 only
— FOR DELIVERY —
IN U.S.: Jack Vander White, C64 ALIVE!, P.O. Box 232115, Sacramento, CA 95823
Outside North America write for prices.

Circle Reader Service Number 229

YOU NEED A QUICK BROWN BOX IF YOU ARE A SERIOUS C64/128 USER

When inspiration strikes, load your word processor (or any other program) in less than a second :: Store all your frequently used programs in this battery backed RAM cartridge :: The QBB can Auto-Start a program upon power up, for unattended operation :: Stores data files, text, or spread sheets for instant access (only with specially adapted programs)

Battery life 5-10 years :: NOT recommended for GEOS or other disk intensive software.

Sizes 64K (250 blocks) \$79; 128K (500 blocks) \$129; 256K (1000 blocks) \$169.

All sizes + \$4. shipping, \$5., overseas, MA residents add 5% tax

BROWN BOXES, INC. 26 Concord Rd., Bedford, MA 01730 (617) 275-0090 or (617) 862-3675

COMPUTER REPAIR

C-64: \$40.00 1541: \$54.95 64C: \$50.00
1541-II: \$64.95 C128: \$64.95 C128D: \$74.95
1581: \$64.95 ETC....

WE ALSO REPAIR IBM Clones, Sega, Genesis, Nintendo

For more info call: **BEAR TECHNOLOGIES**
Computer Sales, Service & Repair
1005 McKean Street, Philadelphia, PA 19148

215-336-5295 1-800-640-7400

Circle Reader Service Number 152

DEPENDABLE SERVICE FOR YOUR COMMODORE!

C-64, 1541, C-128, or 1571: **FAST TURNAROUND!**

\$25.00 PLUS PARTS

Send computer* or drive with name, address, phone, & describe problem. We'll call with parts estimate, then repair and return to you insured by UPS. Payment can be COD or VISA, M/C. Minimum charge, estimate only is \$20. *Include power supply.

AUTHORIZED COMMODORE
SERVICE CENTER
★ ★ ★ ★ ★
90 DAY WARRANTY
ON ALL REPAIRS

TYCOM Inc.
503 East St. Dept. C
Pittsfield, MA 01201 (413) 442-9771

Circle Reader Service Number 242

REVIEWS

patients and reduce medical costs. That's a radical thought!

TOM NETSEL

Commodore 64 or 128—\$50

LARRY SHEINGORN
9715 Medical Center Dr., Ste. 502
Rockville, MD 20850
(301) 963-9751

Circle Reader Service Number 414

DIEHARD

At a time when publications dedicated to 8-bit computers are about as scarce as brand-new 1581 drives, it's refreshing to see a new magazine on the newsstand. Well, *newsstand* isn't exactly the right word, because this bimonthly publication is available only by subscription.

This magazine is called *dieHard*, and it's billed as "the Flyer for commodore 8biters." Its editor in chief, Brian L. Costhwaite, says *dieHard* supports most Commodore 8-bit computers, such as the VIC-20, C-16, Plus 4, 64, and 128. Its major focus is on the 64 and 128, however, but Costhwaite says he hopes the magazine will grow enough to support other 8-bit machines as well.

I don't know whether it's an editing quirk or if Costhwaite is taking a poke at Commodore for its minimal support of the 8-bit machines it created, but whenever Commodore's name appears in *dieHard*, Costhwaite spells it with a lowercase c.

The copy of *dieHard* that I saw for this review contains 33 pages in 8½ × 11 format. Two yellow sheets make up the front and back covers, with the whole publication held together by a single staple in the upper left corner. At first glance, *dieHard* looks like a user group newsletter that was printed with geoPublish. At second glance, you'll notice that there's a lot of information between its covers.

Up front is a call to writers for submissions. (Seems like I've often read that plea in newsletters.) As with many new publications, *dieHard* can't afford to pay its authors. They get free copies of the magazine. Since this is *dieHard*'s third issue, Costhwaite is still writing many of the articles himself.

The first article is a collection of word-processing tips and advice to writers. It stresses the importance of correct spelling, proper grammar, and having someone else proofread important documents. The article starts off with the word *editing* as a subhead in a large font—and, unfortunately, the

ATTENTION

ALL COMMODORE 64/64C, AND COMMODORE 128/128D OWNERS

A complete self-tutoring BASIC programming course is available that starts with turning your computer on, to programming just about anything you want! This course is currently used in both High School and Adult Evening Education classes and has also formed the basis of teacher literacy programs. Written by a computer studies teacher, this programming course is one of the finest available today. This complete course of over 220 pages is available for the **COMMODORE 64/64C**, and for the **COMMODORE 128/128D** computers. This course (Volume 1) will take you step by step through a discovery approach to programming and you can do it all in your leisure time! The lessons are filled with examples and easy to understand explanations as well as many programs for you to make up. At the end of each lesson is a test of the information presented. Furthermore, ALL answers are supplied to all the questions, programs and tests. Follow this course step by step, lesson by lesson, and turn yourself into a real programmer! You won't be disappointed!

FOLLOW-UP COURSE (Volume 2) - A 200 page self-learning course for each of the above named computers dealing exclusively with **sequential** and **relative files**. Our teacher uses a unique approach to file handling that was designed especially for students with absolutely no prior file handling experience. Yet by the end of the course you will be able to make up many of your own personal and business file programs. All our courses involve active participation by the learner. You do the specially designed examples, read the complete explanations, follow the instructions, answer the many questions, do the tests, and check your answers.

Each course is only \$21.95 plus \$3.00 for shipping and handling. We have been developing and selling Commodore courses for over 7 years now and if you do not think that we have the best self-tutoring course you have yet come across, then just send the course back to us within 10 days of receipt for the **FULL \$24.95 refund**.

NAME: _____ CG _____

ADDRESS: _____

CITY: _____

STATE/PROV: _____ CODE: _____

I desire the BASIC programming course (Volume 1) ☐

FOLLOW-UP course on file handling (Volume 2) ☐

The computer that the course is needed for:

COMMODORE 64/64C ☐ COMMODORE 128/128D ☐

For U.S. and Can. customers, send \$24.95 per course in the currency of your country. Can. orders add 7% GST. Overseas orders, send \$29.95 U.S.

Brantford Educational Services

222 Portage Road 6 Pioneer Place
P.O. Box 1327 or Brantford, Ontario
Lewiston, New York 14092 N3R 7G7

Fax: (519) 756-6534

MAD MAN SOFTWARE Proudly presents, THE COMPRESSION KIT.

The essential backup utility. Don't use a BBS without it!

Power Users:

- * Increase your disk space by 50% or more!
- * Compress standard PRG/SEQ/USR files.
- * Compress/Archive a set of standard files into one file!
- * Compress an entire 1541/1571/1581 disk into one file!
- * Compress an entire CMD Native Partition into one file.
- * All our utilities have our super reliable verify option!
- * Includes The Compression Kit User's Guide.
- * Supports - 1541/1571/1581/RAMDrive/RAMLink/
CMD Hard Drive/CMD Floppy Drive/Jiffy DOS.

BBS Users:

- * Half the time you spend downloading files!
- * Save big time on your phone bills!

BBS Operators:

- * Increase your library space by 50% or more!
- * Set up your BBS like the pros.
- * Free up more time on your BBS without getting a second phone line.
- * Get special deals for both you and your users.
- * Includes The Compression Kit BBS Operator's Guide.

Price \$39.95 Will ship in February. (Sorry, no advance orders.)

The Messiah is Coming!

ARE YOU READY?

Messiah III: *Nemesis*

Price \$59.95 Invading your home this spring!

Mad Man Software
7610 West 5th Avenue, Suite 200
Lakewood, Co. 80226

We support Commodore users!

Circle Reader Service Number 260



8 BIT

PO BOX 542

LINDENHURST NY 11757-0542

KEYBOARD SEELS

Protects your keyboard
even while you type!
C64 or Vic 20.....#VS64
Comm. 64C.....#VS64C
Comm. 128.....#VS128
Save your Commodore!
ONLY \$19.00

MINDSCAPE POWERPLAYERS JOYSTICK



**WOW
ONLY
\$5.00**



After Burner, Shinobi
Alien Syndrome,
Thunderblade & Out Run

MANY NEW ITEMS!
SURGE PROTECTORS
CLEANING KITS,
GLARE SCREENS,
PRINTER RIBBONS.
CALL TO REQUEST
A COMPLETE LIST
OF OUR NEW ITEMS!

COMMERCIAL SOFTWARE CLOSEOUTS

Original Packages **ONLY \$5.00 each!**

BATMAN PUFFY'S SAGA
DIE HARD RICK DANGEROUS
BALLISTYX DESTROYER ESCORT
BLOCKOUT CLUBHOUSE SPORTS
PARADROID MONDU'S FIGHT PALACE

CALL TO VERIFY ITEM AVAILABILITY!

SOME ITEMS ARE LIMITED! CALL FOR AVAILABILITY!
SHIPPING \$2.00 For First Item + \$1.00 each additional item
*U.S. Funds Only! *SORRY NO C.O.D.'s OR CREDIT CARD ORDERS
FOR A FREE COPY OF OUR CATALOG, CALL:
(516)-957-1110 MONDAY - FRIDAY 10 am to 5 pm EST

6 PAC SETS

PD & Shareware Sets
**A BIG HIT AT
ONLY \$5.00**

- 1: ASST: Star Trek+
- 2: EDUCATIONAL
- 3: GAMES: Tetris +
- 4: DEMOS/MOVIES
- 5: PRODUCTIVITY
- 6: GEOS CLIP ART
- 7: RECIPES SET
- 8: UTILITIES SET
- 9: CHRISTMAS
- A: ASST: Super Mario
- B: MUSIC SET
- C: ART GALLERY
- D: GEOS FILES
- E: F. G. M.
- F: GAMES: Mario 3+
- G: HACKER PAC
- H: PSA CLIPART
- I: Telecommunications

SIX PAC #2 \$10.00

ADULT IMAGES
You must be over 18
To receive this 6PAC!
Signature Required!
Call to request a more
descriptive 6 PAC list!

Circle Reader Service Number 162

JASON-RANHEIM

CARTRIDGE MATERIALS FOR YOUR COMMODORE 64 or 128

**Quality Products
from the World Leader!**

- Promenade C1 EPROM Programmer
- Game Type Cartridges
- Bank Switching Cartridges
- RAM/ROM Combination Cartridges
- Capture Archival Cartridge System
- Cases, EPROMS, Erasers, Etc.

Call or write for complete information!

Call Toll Free
from California
Tech Support

800-421-7731
916-878-0785
916-878-0785



JASON-RANHEIM

3105 Gayle Lane
Auburn, CA USA 95603

Circle Reader Service Number 257

WE WON'T PAY YOUR TAXES!

But **TAX MASTER** will help you compute them more QUICKLY and EASILY. Be the Master of your Income Taxes with **TAX MASTER**, now available for your 1992 Federal Income Taxes for the C-64/C-128 with single, twin, or dual disk drive and optional printer.

CHECK OUT THESE FEATURES:

- ✓ NEW Tax laws are covered.
- ✓ FORMS 1040, 4562, and Schedules A, B, C, D, E, & F.
- ✓ PERFORMS all arithmetic CORRECTLY.
- ✓ EASY CHANGE of any entry, with automatic RECALCULATION of the entire form.
- ✓ TRANSFERS numbers between forms.
- ✓ CALCULATES your taxes and REFUND. Tax tables are included.
- ✓ SAVES all your data to disk for future changes.
- ✓ PRINTS the data from each form.
- ✓ CALCULATOR function is built-in.
- ✓ DISCOUNT coupon toward the purchase of next year's updated program is included.

Our
Tenth
Edition

TAX MASTER for 1992.....Only \$32

**MASTER
SOFTWARE**

6 Hillery Court
Randallstown, MD 21133
(410) 922-2962

ADD \$2.00 per order shipping and handling US and Canada, \$7.00 foreign. All prices in US Dollars. Canadian orders please use Canadian POSTAL money order. Maryland residents add 5% tax. Dealer inquiries welcome!



Circle Reader Service Number 267

REVIEWS

word is misspelled.

The article goes on to offer some good writing advice, and it even provides a short program that lets you read sequential files. That's a handy little program to have, since writers may submit articles as sequential files. Too bad no one caught one major mistake in the program before it hit the presses. The OPEN command is inadvertently omitted from the line of code that is supposed to open the file for reading. Typos in BASIC programs can be particularly annoying to novices who are trying to learn.

Another page of tips for GEOS is helpful, especially the information about formatting text in columns. Another short article offers good basic computer-related advice. There are tips warning against writing on disk labels with ballpoint pens, covering the vents in electronic equipment, and letting dust get into things. Humor is not a neglected commodity in this article, which offers a range of advice. For those of you whose tempers flare on occasion, Costwaite warns against throwing your computer out the window.

Costwaite has a two-page review of Final Cartridge III. He tells about its many features and ways it can aid programmers. I was all set to order one but discovered that the review doesn't supply ordering information. Guess I'll have to check an old copy of Gazette or RUN to find an advertisement for it. An article about public domain software is a bit more helpful, since it provides addresses for several sources of PD disks.

In an article called "Shhh It's A Secret," Costwaite provides some interesting programming tips. I knew that the Ctrl key could be used in conjunction with other keys to produce some surprising results, but this article lists a number of interesting combinations. Did you

know that Ctrl+; moves your cursor to the right? How about Ctrl+M? That's the same as hitting the Return key.

A feature article about the Commodore text screen provides a lot of PEEKs and POKEs, screen addresses, and animation routines for the 64, 128, VIC-20, and other 8-bit Commodore machines. This article goes on for several pages and provides some good solid programming examples.

What's a good Commodore magazine without type-in programs? Well, *dieHard* has those, too. About 10 of the 33 pages in this issue are devoted to programs. A 128 program that prints a grocery shopping list, complete with prices, looks useful. I'll have to confess that I haven't typed it in yet. No method for avoiding typos is offered (such as Gazette's Automatic Proofreader), but the listings seem to be in pretty straightforward BASIC and shouldn't be a problem.

The articles presented in *dieHard* seem accurate, entertaining, and informative. Its format is simple, not flashy. Let's face it—it's about what you'd expect from something published on a 64. Like any new venture, *dieHard* has some bugs to work out.

One problem I have is the magazine's typeface. A font shouldn't draw attention to itself, but *dieHard*'s light eight-point GEOS font is tough to read in many instances. The dots make it look as though the type is fading from the page. I notice that text is much easier to read whenever an article is set in boldface.

Spelling errors also draw my attention away from the magazine's message. I'll have to say that the main articles contain very few errors. I'll attribute that to the author, editor, proofreader, and any spelling checker they might have used. This same care with the English language is absent, however, in many of the magazine's in-house ads. In one three-paragraph pitch to

**EASY
TO USE!**

Gazette Index

Everything's included!

Features, games, reviews, education/home applications, programming, bugswatter, feedback, and columns!

A superb interface includes pull-down menus, help screens, and keyboard, joystick, or mouse control. Features include super-fast searching and sorting capabilities. An options screen allows you to choose text colors, drive number, and input device. And there's **full documentation on disk.**

Choose from three modes of operation—browse for quick scanning, view for detailed information and descriptions, and *edit* for adding items from upcoming issues—and print to any printer. There's even a turbo-load option for maximum disk-access speed.

**ORDER YOUR
GAZETTE INDEX
TODAY!**

(MasterCard and Visa accepted on orders with subtotal over \$20.)

To order, send \$7.95 per disk, the quantity of disks ordered, check or money order,* your name and complete street address:

Gazette Index
324 West Wendover Avenue
Suite 200
Greensboro, NC 27408

*Please add \$2 shipping & handling (\$5 foreign) for each disk (residents of NC, NJ, NY please add applicable sales tax; Canadian orders, add 7% goods and services tax).

All payments must be in U.S. funds. Please allow 4 weeks for delivery.

The GRAPEVINE GROUP COMMODORE UPGRADES

Inc. 

512K RAM EXPANDERS

By special arrangement with Commodore, we have purchased 512K 1750 RAM expander units for your C64 or C128 computer. These have been factory upgraded from 1764. Now keep up with the latest technology. Upgrade to 512K with a simple plug-in module. Completely compatible and comes with software. If you have a C64 you will need a heavier power supply (4.3 amp), which we will give you for \$31.00. C128 users do not need this power supply. This is the original Commodore unit with over 800,000 sold. Last chance to get more memory! **\$99.95**
Super 1750 REU CLONE (512K). Does not require a larger power supply **\$142.50**

SPECIALS

- **COMPUTER SAVER:** This C-64 Protection System saves you costly repairs. Over 52% of C-64 failures are caused by malfunctioning power supplies that destroy your computer. Installs in seconds between power supply & C-64. No soldering. 2 yr. wty. An absolute must and great seller. **\$17.95**
- **PRINTER PORT ADAPTER** by Omnitronix. Avoid obsolescence. Allows you to use any Commodore (C-64) printer on any PC compatible or clone. Does not work with Amiga. ... **\$34.95**

COMMODORE DIAGNOSTICIAN II

Originally developed as a software package, then converted to a readable format, the Diagnostician has become a fantastic seller. With over 38,000 sold worldwide, Diagnostician II utilizes sophisticated cross-reference grids to locate faulty components (ICs) on all C-64 and C1541 computers (C-128/64 mode). Save money and downtime by promptly locating what chip(s) have failed. (No equipment of any kind needed.) Success rate from diagnosis-to-repair is 98%. Includes basic schematic **\$6.95** (Available for Amiga computers with 3 1/2" disk at **\$14.95**).

NEW POWER SUPPLIES

- A super-heavy, repairable, "not sealed" C-64 power supply with an output of 4.3 amps (that's over 3x as powerful as the original). Featuring 1 yr. wty., ext. fuse, schematics, UL approved ... **\$37.95**
(Includes bonus Commodore Diagnostician II (valued @ **\$6.95**))
- **Our Biggest Seller** • 1.8 amp repairable heavy duty supply for C-64. (Over 120,000 sold). **\$24.95**
- **A500 45 watt (heavy duty) Standard replacement** **\$67.50**
- **200 Watt "Big Foot" A500 Universal Switching Power Supply** with fan and external cabling for hard disks, etc. An absolute must for those adding on more memory/peripherals (e.g. Prima) Works in all countries worldwide. A natural replacement **\$86.95**
- **A200 110/220 volt P/S (200 watts/fan) by Commodore** **\$129.50**

REPLACEMENT/UPGRADE CHIPS & PARTS

6510 CPU.....	
6526 CIA.....	
6581 SID.....	
6567 Video.....	
PLA 906114.....	
All 901/225-6-7-9.....	
4164 (C-64/RAM).....	
C-128 ROMs Upgrade (set 3).....	\$24.95
C1571 ROM Upgrade (310654-05).....	\$10.95
C-64 Keyboard (new).....	\$19.95
C64 Cabinet (new).....	\$49.95
Interface Cables: #690 C64 to 1541/1571 disk drive.....	\$12.95
#693 C64 to 3 pin RCA (eg. 1084).....	\$16.95
1541/1571 Drive Alignment.....	\$21.95
Super Graphics by Xetec.....	\$59.50
Service Manuals for C64, C128, 1802, 1084SP, 1541.....	\$21.95

\$9.95
EACH

EMERGENCY STARTUP KITS

Save a lot of time and money by repairing your own Commodore or Amiga computer. All chips are direct socket plug-ins (no soldering). Each kit includes all you need to "start up"/revive your broken computer. Originally blister packed for the government PXs worldwide, this series is now available to you. Total cost savings per kit far exceeds purchasing chips on an individual basis.

KIT #3 (Part #DIA 15) for C64

Symptoms: No power up • Screen lock up • Flashing colors • Game cartridge problems
Contains: ICs #PLA/82S100/906114, 6526, Commodore Diagnostician, Fuse, Chip Puller, 8 RAMs, Schematic, Utility Cartridge & special diagnostic test diskette with 9 programs
An **\$87.50** value for only **\$29.95**

KIT #4 (Part #DIA 16) for C64

Symptoms: Control Port • Sound • Keyboard • Serial device problems
Contains: ICs #6526, 6581, 8 RAMs, Commodore Diagnostician, Fuse, Chip Puller, Basic Schematic, Utility Cartridge & special diagnostic test diskette with 9 programs
A **\$79.80** value for only **\$29.95**

KIT #5 (Part #DIA 17) for 1541/1571

Symptoms: Drive runs continuously • Motor won't stop • Read errors • No power up
Contains: ICs #6502, 6522, Fuse Chip Puller, Basic Schematic, Commodore Diagnostician & special diagnostic test diskette with 9 programs
An **\$70.10** value for only **\$29.95**

KIT #1 (Part #DIA 14) for Amiga 500/2000

Kit corrects 28 symptoms and includes: Two 8520A CIA Chips, 8362, 8370, 8364, Chip Puller, Fuse, Schematic, Diagnostician Booklet & The Final Test Diskette. A **\$224.00** Value for **\$99.50**
w/8373 Super Denise **\$109.95**
A **\$79.80** value for only **\$29.95**

Send For Free Catalog

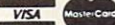
3 CHESTNUT ST., SUFFERN, NY 10901 • ORDER LINE 1-800-292-7445 FAX 914-357-6243

CUSTOMER SERVICE: 914-368-4242 • INTERNATIONAL ORDER LINE: 914-357-2424

We Ship Worldwide • Prices subject to change • 15% Restocking Charge

Holiday Hours: 9-7 E.T. M-F; 10-2 E.T. Sat.

Tell a friend you've heard it through the Grapevine.



Upgrade your Commodore system

Refurbished Hardware SALE HERE! NEW MODEMS

MONITORS	DRIVES	OTHER	NEW MODEMS
1701 - \$235 \$209	1541 - \$100 \$89	1660 - \$30 \$25	64/128/AMIGA-2400 BAUD - \$119 \$99
1702 - \$255 \$229	1541-II - \$120 \$109	1670 - \$50 \$45	64/128/AMIGA-1200 BAUD - \$89 \$79
1801 - \$265 \$239	1571 - \$165 \$154	C64 - \$100 \$94	APROSAND-4 SLOT CARTRIDGE
1802 - \$285 \$259	1571-II - \$185 \$174	64C - \$120 \$114	EXPANDER FOR THE 64/128 - \$40 \$36
1901 - \$295 \$269	1581 - \$180 \$169	C128 - \$175 \$169	New CMD accessories
1902 - \$305 \$279	1001SFD - \$150 \$139	C128D - \$325	JIFFYDOS 64/128 & ANYDRIVE "SYSTEM" - \$85
1064e - \$325 \$299	1530 DATASETTE - \$35		128D/ANY DRIVE "SYSTEM" - \$95
MANY BOOKS - \$10	SOFTWARE - \$10-20		ADDITIONAL DRIVE ROMS - \$45
ASK FOR ANYTHING, I MIGHT HAVE IT!			RAMLINK/RAMCARD C/W BATTERY (0Mb) - \$345
			1Mb RAM SIMM - \$75 4Mb RAM SIMM - \$250

J.P. PBM PRODUCTS BY MAIL
N. Sheridan Mall Postal Outlet, Box #60515
DOWNSVIEW, ONTARIO, M3L 1B0

SHIPPING INCLUDED FOR CANADA, USA +15%
15 DAY WARRANTY ON REFURBISHED GOODS
TAX - Canada +7% GST, Ontario Res. +8% PST

ISLAND OF THE DRAGONS
ACTION/ADVENTURE/ROLE PLAYING GAME FOR THE C-64
AMIGA-LIKE GRAPHICS/STORY UNFOLDS LIKE A MOVIE
EXPLORE THE ISLAND/BATTLE PREHISTORIC CREATURES
\$19.95 Check or Money order to:
CREATIVE PIXELS LTD., PO Box 592, Library, PA 15129

Circle Reader Service Number 113

STARSHIP BATTLES

C-128

- * Command your own Starship from over 20 classes of ships in 5 Empires.
- * Hi-Res 320x200, 8 color graphics.
- * Dynamic sound effects.
- * Many weapons and game customizing features.
- * Send \$19.95 Check or money order to:

MICRO DESIGNS
PO Box 1235
Manassas, VA 22110

**SUPER MARIO BROSTM
FOR THE C-64/128!**

This fantastic PD version boasts 32 worlds, dazzling graphics and awesome sound! 37 OTHER TOP QUALITY GAMES are included on two disks! At 32 cents a game, this is a bargain a true game lover can't pass up! To order, send your return address & \$9.00 for each Game Pack plus \$3 postage and handling to:

PowerDisk • 6813 Lotus Way, West Jordan, UT 84084

TM Super Mario Bros. is a registered trademark of Nintendo.

RECORD FILER I
START YOUR OWN
HOME MAIL LABEL
BUSINESS

RFI the 3 in 1 Program
DISK for the C-64
Mail Check or M.O.

ENTERPRISES
SOFTWARE
P.O. BOX 77123
NATIONAL CAPITAL STATION
WASHINGTON, DC 20013

*Record Keeper = 202 characters per record. Disk record capacity 1541=540; 1571=745. ** Record Printout 1 or 2 columns. ***Mail Label Printout 1, 2, or 3 columns. NO SET-UP/BOOK/MANUAL NEEDED BUILT-IN INSTRUCTIONS-ALL YOU DO IS TYPE. Write-Read-Edit-List-Print-Delete; Fast Search by 4 methods/6 types + 'Unique' Search searches and/or print from any set of unique letters in record. CORRECTION Routine restores files/limited power safeguard. PRINTOUT BY DATA FROM ANY OF 9 FIELDS. FIELD/CHARACTER SIZE; Name/32 Address/32 City/25 State/20 Zip/10 S.S. or I.D./11 Phone #/12 Remark 1/30 Remark 2/30 total 202 Characters Screen for Color or Black and White. NOTHING HIDES FROM RFI - RELAX - LET RFI DO THE WORK FOR YOU!! BUILD A LIBRARY OF LIST DISKS WITH RFI. Cost = \$39.95 + \$4 S/H USA; Canada and Mexico + \$6 S/H; Overseas + \$10 S/H. Check or Money Order Only! 2 to 5 weeks delivery.

DISKS O'PLENTY INC

8362 PINES BLVD. SUITE 270A
PEMBROKE PINES FL 33024
(305) 963-7750

Call or write for free descriptive catalog of
C64/128 Public Domain & Shareware
Choose from over 900 Disks
Adult list of over 50 Disks available
to those 18 or over.

Choose 6 for \$5.00
LIMITED OFFER

021MU	SID MUSIC UTILITIES
019GR	PRINTSHOP UTILITIES
019ED	JR HIGH EDUCATION
062ED	HIGH SCHOOL EDUC.
033ED	TYPING / SPANISH
031ED	COMPUTER SCIENCE
010UT	PIRATES TOOLBOX
119GA	FOREIGN ARCADE
022GA	CASINO-BOARD GAMES
021GE	GEOS FONTS
002MS	LOTTERY PROGRAMS
003MS	COLLECTORS CORNER

Circle Reader Service Number 253

sell advertising space, I counted 11 misspelled words. In another half-column ad requesting articles and programs, the word *submissions* was spelled three different ways—and not one was correct!

In a time when Commodore-related information is hard to find, I laud Costhwaite and his 8-bit diehards for their publishing efforts. They've packed a lot of useful information into the magazine. I hope the magazine gets the support it deserves. In return, as publishers who want to sell their words to the public, they have a professional responsibility to make sure those words are spelled correctly.

CHRISTIAN FLEMING

LynnCarthy Industries
12 bimonthly issues—\$15
DIEHARD
P.O. Box 392
Boise, ID 83701
Circle Reader Service Number 415

Send New
Product
Announcements
and/or
Press Releases
on your
Commodore
64/128
products to:
**Tom Netsel c/o
COMPUTE**

Bug-Swatters

James T. Jones of Klondike, Texas, pointed out two errors in our October 1992 issue. In "Beginner BASIC," we omitted the REM command in line 30. The line should be corrected to read as follows.

30 POKE 646,5: REM SET CURSOR COLOR

Also, to store labels in some other area of memory in La BASIC, line 10 should be entered to read as follows.

**10 TP=TP-32: POKE 49969,TP/
256: POKE 49970,TP-INT (TP/
256)*TP**

John Nauman of Arden Hills, Minnesota, discovered an error in the listing that accompanied Jim Butterfield's November "Machine Language" column. The article mentions three machine language programs, but the program uses only two of them. Change the SYS address in line 460 to 8192, and the program should work correctly.

Nix Null Modems

In October's "Feedback," you answered a question about how to transfer files from a 64 to an IBM by using a null modem cable. There's another way without using a cable if both computers have modems, and it doesn't require calling a third computer. Simply unplug one modem's telephone cable from the wall and plug it into the other modem. Many modems have extra sockets built into them.

Next, run both terminal programs, making sure that their baud rate and other telecommunication parameters are the same. Then, on either machine, dial a number. This can be done by dialing any number you may have in a dialing directory or by using manual AT commands. Type

ATDP for pulse or ATDT for tone and at least one digit. Since you aren't connected to a telephone line, it doesn't matter which command or number you use. Do this so the computer will dial and generate an originate tone.

Quickly type ATA on the other machine to have it answer. You should see a message on both screens saying that they have connected. Then have the 64's program upload the files, and instruct the the Amiga or IBM to download them.

BOB KUBOTA
LOWELL, OH

Which Machine?

Since you changed Gazette's format, I've been dissatisfied with your leaving out a directory which references 64 programs clearly. In prior issues, each article showed what computer system the article pertained to. Also, since you lack a phone number, it's impossible for me to call in this complaint.

CHARLES J. JACKSON
ASTORIA, NY

We usually publish system information in the opening paragraphs of each article. If you find it helpful to have that information on the table of contents page, we'll reinstate it with this issue.

COMPUTE, like most other magazines, publishes its address and telephone number on its table of contents page. Advertising, distribution, and editorial information is listed. To contact the COMPUTE, Gazette, or Amiga editorial offices, write to 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. Our phone number—which is not toll-free—is (919) 275-9809. Our 800 number handles subscriptions and changes of address. That number is (800) 727-6937.

Random Numbers

How can I generate random numbers on my 64 between 100 and 200 by steps of 5?

ALBERT WIGMORE
ORLANDO, FL

There are a couple of ways to do it. The range you need—100, 105, 110, and so on up to 200—contains 21 different numbers. If you generate a random number between 0 and 20, this will cover the range of 21. Then multiply this number by 5 to produce the steps, and add it to 100, which is your base of 100. This will give you the desired results. Here's a sample program to show how it's done.

**10 N=INT(RND(1)*21)
20 N=N*5+100
30 PRINT N**

Another method is to generate a random number between 100 and 200 and then check to see if it's one of the desired numbers. This can be done with a FOR-NEXT loop that is incremented by steps of 5. Here's how it works.

Generate a random number within your range of 100–200; then use a FOR-NEXT loop to check and see if it's equal to 100. If not, increment your loop by 5 and check to see if the number is equal to 105, and so on up to 200. If no equal condition is found, the program generates another random number and repeats the process. When the condition is equal, the number is printed, and the program jumps to line 50. You'll notice that this second method executes more slowly than the first example.

**10 N=INT(RND(1)*101)+100
20 FOR B=100 TO 200 STEP 5: IF
N=B THEN PRINT N: GOTO 50
30 NEXT
40 GOTO 10
50 PRINT "THAT'S IT!"**

**Corrections for
earlier programs,
moving files
between computers,
and more**

BEGINNER BASIC

Larry Cotton

PUT WAIT TO WORK

This month we'll look at the often-ignored WAIT statement—the last of the three BASIC statements that cause the 64 or 128 to wait for something to happen. In the case of GET and INPUT, discussed here over the last two months, the computer waits for the user to press a key on the keyboard. With WAIT, however, the computer waits for a particular memory address to have a particular value.

WAIT is a command, like LET, which really doesn't ever need to be used. It can be used, however, as a replacement for GET and PEEK.

WAIT's normal syntax is WAIT MA, A, B, where MA is a memory address and A and B are two masks. The WAIT statement takes the value in the memory location and performs a logical AND operation with the value in the first mask and then performs an exclusive OR on the result with the second mask. Now you can see why WAIT isn't BASIC's most popular statement.

Fortunately, WAIT's second mask is optional. The following is a common example.

```
10 PRINT“(CLR)(DOWN) PRESS  
ANY KEY.”  
20 WAIT198,1: POKE198,0  
30 PRINT“END OF PROGRAM.”
```

The 64 and 128 have a ten-character area in memory—a buffer—that holds keystrokes that are entered faster than the computer can process them. In SpeedScript, it's easy to see this phenomenon when trying to insert words near the beginning of a long document.

Memory register 198 contains the number of characters in that buffer. Line 20 waits until a key has been

pressed and then clears the buffer so that the keypress isn't displayed onscreen. This program runs infinitely.

```
10 PRINT“(DOWN)TYPE RUN,  
THEN PRESS ENTER”  
20 WAIT198,4
```

The way to end this little mind-boggler is to type a syntax error (such as RUD) or hit Run/Stop-Restore. Here's how to use WAIT instead of GET in a subroutine.

```
10 PRINT“(CLR)”  
20 FOR=54272T054295:  
POKE0,NEXT  
30 POKE54296,15  
40 FOR=1T0300: NEXT  
50 POKE54277,8  
60 PRINT“(DOWN)(2 SPACES)  
TURN UP VOLUME AND PRESS  
ANY KEY (DOWN)”  
70 FOR=1T07  
80 GOSUB200  
90 READD1,D2,$$  
100 POKE54273,D1:  
POKE54272,D2  
110 POKE54276,16:  
POKE54276,17  
120 PRINT$$;  
130 NEXT: END  
140 DATA25,30,“(2 SPACES)  
ONE”,18,209,“(1  
SPACE)BYTE'S”,18,209,“(1  
SPACE)THE”,19,239,“(1  
SPACE)SAME”  
150 DATA18,209,“(1  
SPACE)AS”,23,181,“(1  
SPACE)EIGHT”,25,30,“(1  
SPACE)BITS.(DOWN)”  
200 WAIT198,1: POKE198,0:  
RETURN
```

Lines 10–60 prepare the screen and the computer's sound chip, as we've seen in previous columns. Line 70 begins a FOR-NEXT loop that ends at line 130. Seven times, line 80 calls our WAIT subroutine at line 200. After a key is pressed, line 90 reads three pieces of data: two frequencies for the notes played and a word corresponding to each note.

Line 100 pokes the note frequencies to their appropriate memory registers, while line 110 turns the note off and then on. (In this case, the person pressing the keys controls the length of time the notes play; a FOR-NEXT delay loop wouldn't work. The voice's envelope thus helps control the notes' playing time.)

Line 120 prints the message, while line 130 closes the FOR-NEXT loop and ends the program.

Following are two other ways to write the keypress-waiting subroutine.

```
200 GETA$: IFA$=“”THEN200  
210 RETURN
```

or

```
200 IFPEEK(197)=64THEN200  
210 RETURN
```

The first alternative works better. Note that RETURN cannot be on line 200. The second alternative has been studied in another column. Memory register 197 holds keyboard matrix values; 64 is the value in 197 if no key is pressed. As soon as a key is pressed, control drops to the RETURN in line 210. If you try this, you'll notice that it really doesn't work very well. The keys must be tapped rather than pressed to avoid words spewing out too fast.

In the remaining space, let's discuss LET, a command to assign values to variables.

```
10 LET A = 5: LET F$ = “APPLE”  
20 PRINT A, F$  
30 LET A = A + 3: LET F$ = F$ +  
“SAUCE”  
40 PRINT A, F$
```

LET makes code easier for novices to understand, but its use is entirely optional. This example shows how the same variable can be used on both sides of the equal sign. □

Put the often-
ignored
WAIT statement
to work in
your BASIC programs.

KASARA MICRO SYSTEMS 1-800-248-2983 1-803-681-5515

Mention this ad and receive a 1541/C64 Diagnostician (a \$6.95 value) FREE with any \$30.00 parts/repair order

SAVE MONEY	on MONTHLY SPECIALS and 90 DAY WARRANTY on all Parts and/or Repairs
LOW PRICES	on EXTENSIVE INVENTORY of Commodore ICs, PSs, PC Bds., and Accessories.
QUALITY SERVICE	at GUARANTEED below suggested retail with quantity discounted prices
FOR 10 YEARS	your RELIABLE SOURCE for Amiga, CBM, and now PC Product Line ICs

Weekday Hours 9:00 AM-6:00 PM EST



FREE Copymachine-1 program makes in 1-3 minutes a top quality copy of an unprotected disk in one 1541 drive. Ask your User Group librarian, or send your name, address and \$2 for shipping to :

C64/1541 John Takas
6014 Atwell Rd.
Toledo OH 43613-1024

FREE

Outside US and Canada:
VECTOR-CURLIN
Apartado 311, S/C La Palma
Canarias, E-38700 Spain

If you have Copymachine-1, please make copies of it for your friends.

Circle Reader Service Number 258



ESCAPE ROUTE

The Adventures of

Eric Hawthorne, P.I.

C-64 or C-128 in 64 MODE
ACTION/STRATEGY/BOARD GAME
Catch the infamous ICELADY before she crosses the border!
Fun for all ages!

\$19.95 Check or Money Order
CREATIVE PIXELS LTD.
PO Box 592, Library, PA 15129

Circle Reader Service Number 113

LOTS OF DISKS! THE BEST IN G4 128 PD.

**GEOS, Graphics, Clipart, Demos, Games,
Bible, SID/MIDI, Education, Basic8!**

We have what you're looking for!
Send stamp for FREE catalog!

DISCOVERIES

PO Box 9153, Waukegan, IL 60079

Circle Reader Service Number 122

KeyDOS ROM Version 2 is here!

The KeyDOS ROM is a chip for the empty socket inside your C128 that adds more than 40 powerful features. KeyDOS is available instantly as soon as you switch on your 128!
KeyDOS is loaded with useful tools to simplify file access on multiple drive systems without typing file names—all major DOS functions included. Select multiple files for copying, viewing, printing, renaming or scratching. ASCII/CBM/Screen code converter. Full support for 1581 subdirectories. Built-in RAMDOS for REUs up to 2MB. New GEOS SuperBoot.
Alarm clock. Disk editor. Powerful debugger.

Only \$32.50. Satisfaction Guaranteed! Write for more information.
Enhance your system with the speed and convenience that KeyDOS provides!

Antigrav Toolkit, PO Box 1074, Cambridge, MA 02142

Shipping outside of US, Canada and Mexico add \$3

Circle Reader Service Number 244

10% OFF ALL ITEM PRICES BELOW! C-64 ** C-128
—ends 8/31/93 (S & H excluded.) Plus/4 * C-16

PSG-PrintShp Grphcs-- Sd/sides--G/games--M/math
S/science--E/English--ED/educ.--GE/geog.
UT/util.--PR/productivity--TE/telcommunication
Note PSG-A/3 Bk/non-C= & B/2 Bk/C= Printer!

Item ----- (# of Sd or ID)/cost/ S&H
A: KJV Bible--2 sd Mus, A or B PSG & G 36/35+4
B: Holiday-2 Mus+ A or B PSG -Hol/Relig 8/ 7+2
C: SMario3,Krkout,Pokr,36 G-Fin-Grfx,DB 6/ 5+2
D: 128 Potpourri ----- UT/ PR/ ED/ 6/ TE 6/ 5+2
E: PLUS/4 Combo ----- UT/ PR/ ED/ 6/ TE 6/ 5+2
F: Bks(48p)--Inst Activities C= or Apple
Apple Fun...Logo...Mus--Reg. \$3.95 Bk/ 1+2
G: Educ Pack A--M-S-E-GE-etc-----145 Prgs 12/13+2
H: Educ Pack B--M-S-E-GE-etc-----688 Prgs 6/78+7
I: Bks(119p)--C64 or 128-Aeaz G/ \$9.95, Bk/ 3+2
J: 6 Pack A-MarioBrew--Shar-SharII-Shar3
+Tetris Clones-C64/64C/C-128(180c) 2/ 9+1
K: 6 Pack B-Irshman,Strraider,ArDe,Outpst, 2/ 9+1
L: People-554 MI-Fm-Child AcorB PSG +Prgs 7/ 8+2
M: Disk Notcher-Use back of DS/DB disks! DN/ 3+1
N: Recipe Potpourri-178 recipes-Programs 3/ 7+1
O: KJV Bible-t/4--Tyt files + 1 sd Prgs 38/38+4
P: 6 Pack C/C-128-68+Star Trk-Concent.. 18/13+2
Q: Musique Classique-----30+ selections 3/ 7+2
R: Pets-----347 Domestic animals PSG - 5/10+2
S: SPORTS-419 Mix-Bsbl/Ftbl/1+ PSG+Prgs 5/10+2
T: Cartoon Characters--Mixture 282 PSG 2/ 5+2
U: Comptr Parade-255 PSG-Ap/Cs/18M Logos 2/ 5+2
V: Fastcad VI (Enh CAD 3.0) +Supt Files 5/10+2
W: Fun Graph Mach Demo+UT+58 Fnts+HR DMP 3/ 6+2
X: 1541/71/81 UT Combo-Rdr/Copr/Mvr/ etc 6/12+3
Y: GEOS Info-Programmer's Manual (89p) +
GEOS 1.0 Documentation (27p)--(C-64) 3/ 8+2
Z: KJV Bib-128 w/40-88 reader/printer +
2 each of music, A or B PSG, & games 36/35+4

Available-JIM HEHL COLLECTION +/4 * C-16 * C-64
JH-00-Bible-Time +/4-64-25+ Relig. Prgs 3/ 6+1
JH-01-Plus/4 6 Pack-Has 150 plus games 19/38+5
JH-02-T-Pack +/4--Terminal prgs & terna 4/ 9+1
JH-03-C-16 Combo-58+ Prgs. Runs on +/4! 2/ 4+1
JH-04-Superbase +/4-Powerful DBase prg. 2/ 4+1
JH-05-H.A.L. (upd)-Assemblr+4 -Spdsctpt+4 4/ 9+1
JH-06-UT+/4--Prnter, Cprs, & Grphcs Prgs 5/12+3
JH-07-C64-Prntd Wd/Fle--C64 v 4 SM ROM 2/ 5+2
Send "SASE" for more information on above items.

Req. \$/disk side: \$3 -->\$1.50 +S&H \$2/0 10 Sd Flat
CATALOGS: C64/128-47p (\$2+2) Plus/4-18p (\$2+1)
PYMT-MO/CX(US\$)-Ca.Res.+8.25% tax/fee total
No CDD's--Foreign/International Rates S&H
PROCESSING: BnkChk/MO-First * Chk when cleared.

TO: Kenneth Franklin (KF-PD SOFTWARE) ***
POB 478464 * Los Angeles, Ca. 90047-8464
Mainly, we have the PD Select Commodore Library!
We've come to HERE as RUN MAGAZINE PHASES OUT!!
THANKS FOR HELPING US INTO OUR 'THIRD' YEAR!!

Circle Reader Service Number 163

NEW! COMPANION FS-4 NEW!

The ultimate upgrade for Fleet System 4 and Fleet Filers 64/128. Transfer Fleet software to any 15XX drive, hard drive, CMD's RAM LINK, or RAM DRIVE. Get max. speed and productivity! Filers 64/128 upgrades: now access up to four disk drives, easily transfer files between drives. Users may select their favorite screen colors from within Fleet Filers. F-keys now have logical layout, much faster data entry, no more accidental screen dumps. Many other improvements! Complete with templates, help files, spiral bound manual, Plus much more!
C=128, 80 column.

COMPANION FS-4 \$24.95 + \$3.00 S&H

SEC CHECK REGISTER 128

Manage personal or small business checking in a fast/efficient manner. Fast data entry. Unlimited recurring payees. 750 active file transactions. Up to 999 Ref. numbers. Easy editing! Reports printed by, Outstanding Transaction, Transaction, Reference Number, Reference Number & Date, Date, Date & Random Reference Number, or Payee. Print any type of personal or form feed check. Supports all 15XX and hard drives. Custom video fonts, spiral bound manual and much more!
C=128, 80 column

Free Bonus: SEC Financial Calc. 128!
SEC CHECK REGISTER \$24.95 + \$3.00 S&H

ORDER TODAY: Check or Money Order.

SPARKS ELECTRONICS

5316 So. 9th, St. Joseph, MO 64504-1802
Missouri Res. add 6.225% sales tax.

Trademarks of respective
manufacturers/publishers acknowledged.

Circle Reader Service Number 252

MACHINE LANGUAGE

Jim Butterfield

FAST INTERRUPTS

People often ask me why they can't print directly from an interrupt routine. Well, you just can't—but more important, you shouldn't want to. Interrupts are fast if you don't bog them down with too many instructions. You can't get an interrupt from the IRQ while you're still servicing the last one. The NMI interrupt can break in while a prior one is being serviced. It's best to do whatever must be done and get out fast.

It's quite easy to have your interrupt code leave a signal that a background (noninterrupt) program can pick up and handle. Simple signals can be created by adding to or subtracting from a counter. The INC and DEC instructions are ideal for this. More complex data can be put into a rotating buffer; the background program will follow along, picking up remaining information.

This NMI program is a simple demonstration of how a high-level interrupt can pass a message to a background program. The exercise shows how to make the interrupt coding as fast as possible. All we do is perform an increment: INC \$2100. Address 2100 will hold the action counter. A nonzero value will signal the background program that work needs to be done. After the increment, the NMI interrupt returns to wherever its vector had been pointing.

The custom NMI code is linked by storing the address of that NMI vector. On the 64 and 128, the vector is located at \$318/9 (decimal 792/3). We keep the previous address in this vector in order to restore that address when our program is finished and to allow our own code to exit to this each time it's called.

The address held in an interrupt vector is two bytes

long. That can lead to danger if an interrupt strikes at the instant we've changed one byte but not the other. The computer could go to a wrong address. An IRQ can be locked out briefly with SEI to allow that vector to be safely changed. The NMI cannot be locked out, so our best bet is to make sure that the two bytes are changed at almost the same moment.

Starting at address \$2000, the program zeroes two counters: the interrupt counter at \$2100 and the loop counter at \$2101. This is done with LDA (Load A register) and STA (Store A register) commands.

At \$2008, the NMI vectors are copied from \$318/9 to \$2102 and \$2103. Then, we put the address of our NMI code into the vector at \$204C.

2014 LDY #\$4C
; low part of address
2016 LDX #\$20
; high part of address
2018 STY \$0318
201B STX \$0319
; store both parts quickly

The NMI code will now run independently of the program. All our background program needs to do is to keep watching address \$2100 until it's not a 0. One way of doing this is to loop and test address \$2100.

201E LDA #\$00
; test value
2020 CMP \$2100
; if it's 0
2023 BEQ \$0200
; go back and wait

The program falls through to \$2025 when a nonzero value is found in \$2100. That value is decreased with DEC \$2100, and our loop counter is incremented with INC \$2101. Now, the background program will print a message on the screen, using the usu-

al loop to pick the message from \$2052-\$2067.

While all this is going on, one or more new interrupts may have struck. That's no problem. We'll get to them when we've finished the current work. Our loop counter is checked. If it hasn't yet reached five, we'll go back and look for the next interrupt.

2038 LDX \$2101
; is the loop counter
203B CPX #\$05
; equal to five?
203D BNE \$201E
; no, go back

When five interrupt occurrences have been noted, it's time to restore the original NMI vector address. The usual sequence of LDY, LDX, STY, and STX will do this job. After the vector is restored, the program returns to BASIC with RTS.

After each cycle, the tiny NMI program links back to the normal address with an indirect jump. Here's its code, followed by the whole program as a BASIC loader.

204C INC \$2100
204F JMP (\$2102)

```
RQ 100 DATA 169,0,141,0,33,141
      ,1,33,172,24,3,174,25,3
      ,140,2,33
SK 110 DATA 142,3,33,160,76,16
      ,2,32,140,24,3,142,25,3
      ,169,0
GC 120 DATA 205,0,33,240,251,2
      ,06,0,33,238,1,33,162,0,
      ,189,82,32
BH 130 DATA 32,210,255,232,224
      ,22,208,245,174,1,33,22
      ,4,5
GK 140 DATA 208,223,172,2,33,1
      ,74,3,33,140,24,3,142,25
      ,3,96
EJ 150 DATA 238,0,33,108,2,33
BJ 160 DATA 82,69,83,84,79,82,
      ,69,32,75,69,89
DR 170 DATA 32,68,69,84,69,67,
      ,84,69,68,33,13
QP 200 FOR J=8192 TO 8295
EJ 210 READ X:T=T+X
BP 220 POKE J,X
AE 230 NEXT J
SM 240 IF T<>8942 THEN STOP
SK 300 PRINT "INTERRUPT DETECT
      PROGRAM."
EG 310 PRINT "PRESS >RESTORE<
      {SPACE}FIVE TIMES!"
KG 320 SYS 8192
QH 330 PRINT "...END..."
```

**Interrupts provide
fast action,
provided your code
isn't long-winded.**

The Gazette Productivity Manager

(Formerly PowerPak)

Harness the productivity power of your 64 or 128!

Turn your Commodore into a powerful workhorse, keep track of finances, generate reports in a snap, manage your money in minutes—all with the *Gazette Productivity Manager*! Look at all your 64/128 *Productivity Manager* disk contains.

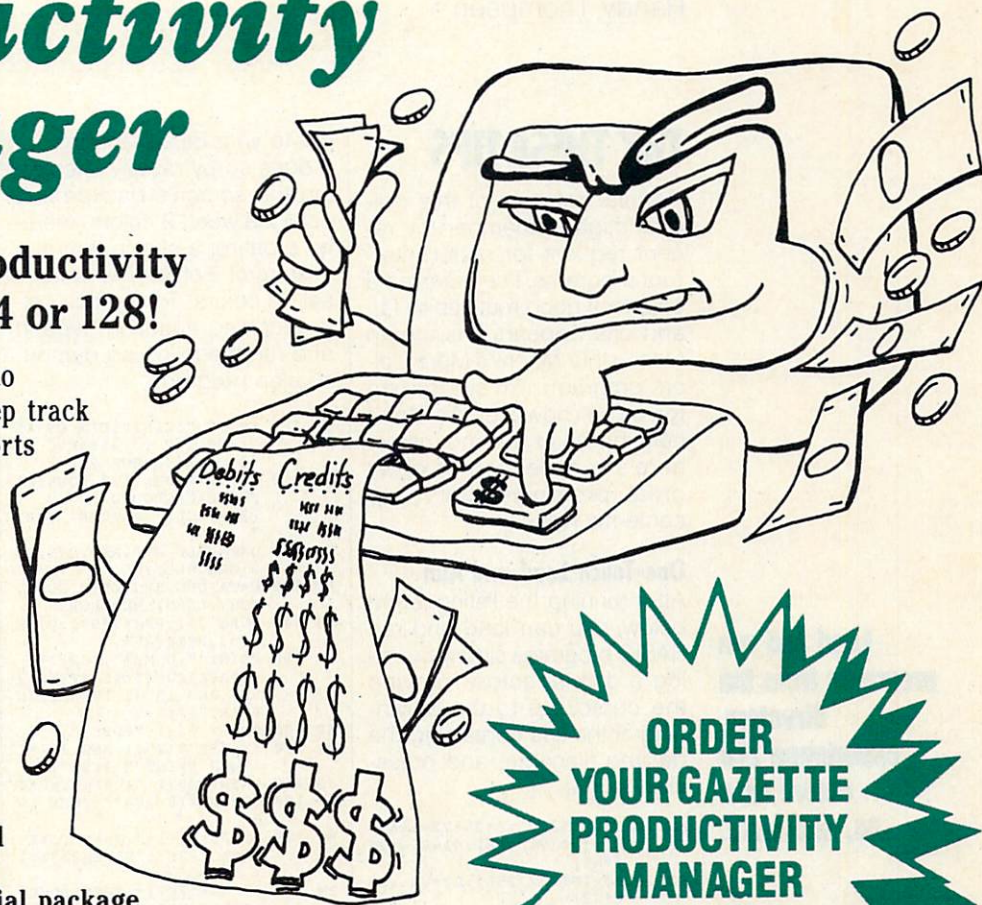
GemCalc 64 & 128—

A complete, powerful, user-friendly spreadsheet with all the features you'd expect in an expensive commercial package (separate 64 and 128 versions are included). Most commands can be performed with a *single* keypress!

Memo Card—Unleashes the power of a full-blown database without the fuss! **Nothing's easier**—it's a truly simple computerized address file. Just type in your data on any one of the index cards. Need to edit? Just use the standard Commodore editing keys. Finished? Just save the data to floppy. What could be easier?

Financial Planner—Answers all of those questions concerning interest, investments, and money management that financial analysts charge big bucks for! You can plan for your children's education and know exactly how much it will cost and how much you need to save every month to reach your goal. Or, decide whether to buy or lease a new car. Use the compound interest and savings function to arrive at accurate estimates of how your money will work for you. **Compute the answer at the click of a key!**

DON'T MISS OUT ON THIS POWERFUL WORKHORSE!



**ORDER
YOUR GAZETTE
PRODUCTIVITY
MANAGER
TODAY!**

(MasterCard and Visa accepted on orders with subtotal over \$20).

☐ **YES!** Please send me — *Productivity Manager* disk(s) (\$14.95 each).

— Subtotal
— Sales Tax (Residents of NC and NY please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.)
— Shipping and Handling (\$2.00 U.S. and Canada, \$3.00 surface mail, \$5.00 airmail per disk.)
— Total Enclosed
— Check or Money Order — MasterCard — VISA

Credit Card No. _____
Signature _____ (Required)
Daytime Telephone No. _____
Name _____
Address _____
City _____
State/Province _____ ZIP/Postal Code _____

Send your order to Gazette Productivity Manager,
324 W. Wendover Ave., Ste. 200, Greensboro, NC 27408.

PROGRAMMER'S PAGE

Randy Thompson

TRY THESE TIPS

Regular readers of this column might remember my recent request for raster interrupt programs. I've received a couple of good routines so far, and one appears this month (see Arthur Moore's More Colors program). I'm still looking for more, however, so don't hold back. In the meantime, here's a collection of other great programs that have come my way.

One-Touch Load and Run

After running the listing found below, you can load and run BASIC programs simply by listing a disk directory, moving the cursor up to the beginning of the line containing the desired filename, and pressing Restore.

```
ED 10 S=49152:V1=S+25:V2=S+67
BF 20 H1=INT(V1/256):L1=V1-(25
6*H1)
GX 30 H2=INT(V2/256):L2=V2-(25
6*H2)
CF 40 FOR I=0 TO 93:READ D:POK
E S+I,D:C=C+D:NEXT
QQ 50 IF C>7825 THEN PRINT "E
RROR IN DATA STATEMENTS"
:END
RP 60 POKE S+14,L1:POKE S+19,H
1
DH 70 POKE S+26,L2:POKE S+28,H
2
KG 80 SYS S:PRINT "AUTO-RUN IS
READY."
ME 90 END
AJ 100 DATA 173,24,3,141,252,3
,173,25,3,141,253,3
GG 110 DATA 120,169,25,141,24,
3,169,192,141,25,3,88
GX 120 DATA 96,169,67,160,192,
32,30,171,169,13,141,11
9
QH 130 DATA 2,141,124,2,169,82
,141,120,2,169,85,141
HS 140 DATA 121,2,169,78,141,1
22,2,169,58,141,123,2
PP 150 DATA 169,6,133,198,108,
252,3,76,79,65,68,29
HA 160 DATA 29,29,29,29,29,29,
29,29,29,29,29,29
GR 170 DATA 29,29,29,29,29,29,
44,56,58,0
```

FRANCISCO FELIX
BAJA CALIFORNIA SUR
MEXICO

More Colors

Add more colors to your programs with this machine language hack. Using a raster interrupt, the following program adds 240 simulated col-

ors to your 64's standard 16. It does so by rapidly alternating the screen's background color between 2 colors, thereby creating a shade that is a mixture of 2 of the computer's set 16 colors. To see this color blending in action, type in and run the following demonstration program.

```
BB 100 PRINT "[CLR]":DIM CS(15
):FOR I=0 TO 15:READ CS
(I):NEXT:GOSUB 240
QX 110 PRINT"[HOME]{19 DOWN}F1
/F7 BACKGROUND
{2 SPACES}[RETURN] TEXT
"
KE 120 DATA BLK,WHT,RED,CYN,PU
R,GRN,BLU,YEL
FQ 130 DATA ORG,BRN,LRED,DGRY,
MGYR,LGRN,LBLU,LGRY
EJ 140 POKE 251,PEEK(253):POKE
252,PEEK(254)
DP 150 PRINT "[HOME]":FOR I=0
{SPACE}TO 15:IF (PEEK(2
53) AND 15)=I THEN PRIN
T"[RVS]";
EP 160 PRINT CS(I)"[OFF]",
PX 170 IF (PEEK(254) AND 15)=I
THEN PRINT "[RVS]";
JQ 180 PRINT CS(I)"[OFF]":NEXT
FR 190 GET AS:IF AS="" THEN 19
0
BQ 200 IF AS="{F1}" THEN POKE
{SPACE}253,(PEEK(253)+1
) AND 15
BM 210 IF AS="{F7}" THEN POKE
{SPACE}254,(PEEK(254)+1
) AND 15
MC 220 IF AS=CHR$(13) THEN POK
E 646,(PEEK(646)+1) AND
15
QB 230 GOTO 140
KK 240 SA=679:FOR I=0 TO 73:REA
D D:POKE SA+I,D:NEXT
XS 250 A=SA+36:POKESA+30,A/256
:POKE SA+25,A-PEEK(SA+3
0)*256:SYS SA:RETURN
JJ 260 DATA 120,173,26,208,9,1
,141,26,208
HX 270 DATA 173,17,208,41,127,
141,17,208
RR 280 DATA 169,0,141,18,208,1
33,2,169,203
GJ 290 DATA 141,20,3,169,2,141
,21,3,88,96
BB 300 DATA 173,25,208,41,1,20
8,3,76,49
RF 310 DATA 234,166,2,181,251,
141,32,208
EP 320 DATA 181,253,141,33,208
,138,73,1
KF 330 DATA 133,2,173,25,208,9
,1,141,25
HE 340 DATA 208,76,129,234
```

Many color combinations can cause the screen to flicker (much like a Commodore Amiga in interlace mode). You can reduce the flickering by turning down your monitor's brightness and contrast, or by selecting more compatible colors.

To use More Colors in your

BASIC programs, simply extract the subroutine found in lines 240-340 from the listing above. After calling this subroutine, you set the two colors that you want the computer to mix by poking their numerical values into locations 253 and 254. For example, to alternate between red and brown, you might execute the commands POKE 253,2:POKE 254,9.

This subroutine currently stores its machine language code in memory starting at location 679. You can change this to another location, such as 49152, simply by changing the variable SA in line 240.

ARTHUR MOORE
ORLANDO, FL

Easier ML Loads

The standard method for loading disk-based machine language programs from BASIC is to start your program with a line such as this.

10 IF L=0 THEN L=1: LOAD "file-name",8,1

You must place this code near the beginning of your program because loads from within BASIC cause your program to reexecute. The IF statement keeps the program from entering an infinite loop that loads the same file over and over again. There's another method, however, that uses a couple of your computer's ROM routines instead of BASIC's LOAD command.

10 POKE 147,0: SYS 57812 "file-name",8,1: SYS 62631

You can use this line of code anywhere within your program without causing the computer to restart itself. This routine gives 64 owners the functional equivalent of the 128's BLOAD command.

MATT ZEILENGA
RIVERSIDE, CA

Load and run
programs from the
directory,
experience 240
colors on a
64, and more.

PUMP UP YOUR PRODUCTIVITY!

Harness the potential of your 64 and 128 with these powerful programs.

Get more work out of your 64 and 128 with these two new disk products from COMPUTE's Gazette – the 1992 Best of Gazette Utilities, and the Gazette Graphics Grab Bag!

The 1992 Best of Gazette Utilities

Seize control of your operating system and your world!

Here's what's on it—MetaBASIC 64, MetaBASIC 128, Quick, Sprint II, Ultrafont+, RAMDisk 64, RAMDisk 128, BASSEM, SciCalc 64, List Formatter, MegaSqueeze.

The Gazette Graphics Grab Bag

Do it all with Commodore graphics!

Here's what's on it—Starburst Graphics, Screen Designer 128, 128 Graphics Compactor, 64 Animator, VDC Graphics, Dissolve 128, Super Slideshow, 128 Animator, 1526 PrintScreen, Supratechnic, Medium-Resolution Graphics, Screen Maker, GAS!64—Special Edition, GAS!128—Special Edition.



**ORDER
THEM
TODAY!**

Extend Your Computer Power With This Powerful Software!

YES!

I want to pump up my productivity! Please send me the disks checked below at \$11.95 each.

☐ The 1992 Best of Gazette Utilities

☐ The Gazette Graphics Grab Bag

☐ Subtotal

☐ Sales Tax (Residents of NC and NY please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.)

☐ Shipping and Handling (\$2.00 U.S. and Canada, \$3.00 surface mail, \$5.00 airmail per disk.)

☐ Total Enclosed

☐ Check or Money Order ☐ MasterCard ☐ VISA

Credit Card No. _____ Exp. Date _____

Signature _____
(Required)

Daytime Telephone No. _____

Name _____

Address _____

City _____

State/Province _____ ZIP/Postal Code _____

MasterCard and VISA accepted on orders with subtotal over \$20.

Mail this coupon to COMPUTE's 1991 Utilities, 324 West Wendover Ave., Ste. 200, Greensboro, NC 27408.

GEOS

Steve Vander Ark

A GEOS TOUR OF Q-LINK

I've spent a lot of time and not a little money on QuantumLink over the past few years, where I go by the innocuous handle of SteveV14. Some of you might know me as a sometimes-host in the Starving Artists Café. Others might recognize me from my endless posts in the GEOS message bases. I've met a lot of great folks on Q-Link, and I'd like to meet more. Feel free to contact me anytime by E-mail.

So what does Q-Link offer that other services don't? Plenty. And if you're a GEOS fan, you simply can't afford to pass up the incredible treasures waiting for you there. Let me give you a GEOS-specific tour of QuantumLink, and you'll see what I mean.

We'll start with the GEOS support area itself, which you locate from the main menu by choosing Commodore Software Support. Here you'll find a wide range of services designed to help you with all of your GEOS needs, and it doesn't matter if you're a GEOS novice or an ace programmer. The folks who run things in the GEOS area are very friendly and willing to help any user who drops by. These are experts, many wearing the GeoRep or GeoHost hats, and they're intimately familiar with GEOS. If you have problems with your equipment, for example, you're sure to find someone who uses a setup similar to yours and can offer advice on keeping everything running smoothly.

Probably the most active section of the GEOS area is the message base. There are sections devoted to GEOS in general; printer support; geoProgrammer; geoFile and geoCalc; geoPublish; and even GeoWorks Ensemble, the PC

version of GEOS. Each of these sections has its own representative who takes the lead in answering questions and offering advice. In the general area, you'll find nice people such as Dave Ferguson and Jim Collette lending their considerable expertise to users with questions, problems, or ideas to share.

The printer support area is masterfully monitored by George Wells under the name GeoRep GHW. George is a printer expert par excellence who can tell you the dip switch settings for just about any interface and printer combination you might want to use with GEOS. George is the author of some of the finest printer drivers available for GEOS. If you have questions about your printer setup—which driver to use, how to make it do what you want it to do, or whatever—George is standing by to give you the most informed answers you'll get anywhere.

Another popular place for GEOS users is the GEOS Chat Room. Every evening from 9:00 to 11:00 Eastern time, a GeoHost shoots the breeze with all who wander in. The conversation can occasionally roam into some pretty esoteric realms, but no matter where the conversation flits to, you'll be able to get quick answers to your GEOS questions. You'll get a chance to meet some of the experts in the Chat Room, too.

Now comes the really exciting part: the software libraries. Q-Link's GEOS libraries are brimming with great files, just waiting for you to download them. The libraries are divided into several categories: BSW Applications, User Applications, Printer/Input Drivers, geoWrite Files, geoPaint Files, geoPublish/Clip Art Files, and Fonts. You'll be delighted and amazed with what you'll find there. Of course,

with all those files available, you might become lost. Don't worry. Once again, you can get some good advice on which files are worth your time from the message area or the Chat Room.

The GEOS support area isn't the only place where you'll find GEOS information on Q-Link. Other excellent places to poke around are the software libraries of the now-defunct *RUN* magazine. I hope these files will remain available on Q-Link, since many of them are particularly good. The download will cost you an extra \$1.50, but for programs such as Import Runner or geoTerm, it's worth it.

Another place to check is the graphics area, which you'll find in the Commodore Information Network under Computing Support Groups. Here you can ask for GEOS graphics advice and be assured of a prompt reply—very likely from me. There are GEOS-format graphics in the picture libraries here.

Probably the best source of GEOS information outside of the GEOS area itself is the Creative Micro Designs support area. That's in the Commodore Information Network area under Hardware Support. CMD is easily the most enthusiastic 64/128 GEOS supporting company left, and it provides plenty of technical advice and support for its GEOS products in its message areas. The libraries contain some GEOS files that you'll want if you buy RAM-Link or RAMDrive.

So what do you do to join? Give QuantumLink a call at (800) 827-8444 for more information. The service costs \$9.95 a month, with additional charges for many areas (including the ones I've been talking about) at the rate of \$4.80 an hour. No other service can offer so much for GEOS and for such a reasonable cost. □

If you're a GEOS fan, you can't afford to pass up the incredible treasures waiting for you on Q-Link.

SOFTWARE CLOSEOUTS

For Commodore 64 & 128

STRATEGIC SIMULATIONS.....\$14.50 EACH
 Curse of Azure Bonds, Hillstar, B-24,
 Pool of Radiance, Roadwar 2000,
 Heroes of the Lance, Dragons of
 Flame, or Pro-Tour Golf.

MICROPROSE.....\$14.50 EACH
 Destroyer Escort, Netherworld, Rick
 Dangerous, Spitfire Ace, Hellcat Ace,
 Solo Flight, Stunt Track Racer, F-15
 Strike Eagle, Airborne Ranger

ACCOLADE BARGAINS.....\$5.00 EACH
 PSI 5 Trading Company, Law of the
 West, Comics, Killed Until Dead,
 Hardball, Dambusters, Ace of Aces,
 Fight Night, or Jet Boys.

TAITO PREMIUM TITLES.....\$9.50 EACH
 Alcon, Arkonoid, Arkonoid II, Bubble
 Bobble, Qix, Operation Wolf, Rambo
 III, Rastan or Renegade.

MINDSCAPE BARGAINS.....\$9.50 EACH
 Mastertype/Writer Bundle, Perfect
 Score SAT, Gauntlet 2, Bop 'n Rumble,
 Color Me, Into the Eagle's Nest, Indoor
 Sports, Boston Computer Diet,
 Songwriter or Golden Oldies.

ELECTRONIC ZOO 20 GAME PACK \$14.50
WOW!! LESS THAN \$1 PER GAME!!!!!!
 Includes: Battlefield, Skatin' USA, Gun
 Fighting, Cross Fired, Spooky Castle, Death
 Race, Snowball in Hell, Globe Trotter,
 Periscope Up, Killing Machine, Super Kid,
 Hobbogoblin, Cave Mania, Zoomerang,
 Crack Up, Zodia, Survivors, Pro Golf,
 League Challenge & Super Kid in Space.

WE HAVE LOTS MORE C-64/128 PLUS
TONS OF SOFTWARE FOR IBM, APPLE,
MAC, AMIGA, ATARI & MORE!

COMPSULT

P.O. BOX 5160
 SAN LUIS OBISPO
 CA 93403-5160

AYALON HILL GAMES.....\$10.00 EACH

Under Fire, Ripper!, Tsushima, Stocks
 & Bonds, Dr. Ruth, Partisan Kings,
 Jupiter Mission 1999, T.A.C., Maxwell
 Manor, Statis-ProBaseball, GulfStrike,
 Guderian, Mission on Thunderhead,
 Super Sunday, or Panzer Jagd.

INFOCOM BARGAINS.....\$5.00 EACH
 Starcross, Suspended, Zork 2 or 3, Deadline.

MINDSCAPE SPORTS BUNDLE.....\$14.50
INCLUDES 12 GREAT GAMES!!!
 Superstar Ice Hockey, Superstar Soccer, 3-D
 Pinball, Billiards, Skee-ball, Shooting Gallery,
 Crazy Pool, Football, Bowling, Darts, Air
 Hockey, & Ping-Pong!!! **GREAT PACKAGE!!!**

THUNDER MOUNTAIN 10-PAK...\$10
Ten Great Games for Ten Bucks!!
 Includes: Mutants, F.I.S.T., Tau Ceti,
 Uridium, Tai-Pan, Cyrus Chess, Army
 Moves, Demolition Mission, Doc the
 Destroyer & Bad Street Brawler.

THREE-SIXTY BARGAINS.....\$5 EACH
 Warlock, Dark Castle or Thud Ridge.
DATA EAST TOP SELLERS.....\$9.50 EACH
 Batman Caped Crusader, Robocop,
 Batman the Movie, Bad Dudes, or
 Monday Night Football.

KONAMI PREMIUM TITLES.....\$9.50 EACH
 Castlevania, Double Dribble or Metal Gear
ACCOLADE DEALS.....\$14.50 EACH
 Heat Wave, Harmony or Steel Thunder.

TO ORDER: Send check or money order, including
 shipping charges of \$5 for U.S.A., \$8 for Canada, \$12 all
 others. California addresses must include 7.25% sales
 tax. To receive our complete catalog of over 2,000 items
 for all computer types, send \$2 in cash or postage
 stamps. The catalog is FREE with any order. To check for
 an item not listed here, call (805) 544-6616.

VISA/MC ORDERS CALL TOLL-FREE

1-800-676-6616

Credit Card Orders Only!!!! (\$25 minimum)

Circle Reader Service Number 220

Only \$24.95



FOR THE C64 AND
 C128 IN 64 MODE

Fun Graphics Machine

FUN GRAPHICS MACHINE (FGM) IS AN "ALL-IN-ONE" GRAPHICS
 PROGRAM FOR THE C-64. WHAT CAN BE CREATED WITH FGM IS
 ONLY LIMITED BY YOUR IMAGINATION. JUST A FEW EXAMPLES:

SUPPORTS ALL CMD DRIVES
 BUSINESS CARDS
 CUSTOM LABELS
 VIDEO TITLING
 NEWSLETTERS
 CALENDARS
 DIAGRAMS
 POSTERS
 FORMS
 FGM GRAPHICS MACHINE SUPPORTS IMPORTING GRAPHICS AND
 HI-RES SCREENS FROM MANY POPULAR PROGRAMS INCLUDING:
 KOALA
 GEOPRINT
 RUN/PAINT
 PRINT SHOP
 ADV. OCP ART
 VIDEO BYTE II
WORKS WITH 1541, 1571 & 1581 DRIVES
 SIGNS
 CHECKS
 OVERLAYS
 BROCHURES
 LETTERHEADS
 CERTIFICATES
 GREETING CARDS
 DISK ENVELOPES
 HANDYSCANNER 64
 COMPUTER EYES
 PRINTMASTER
 NEWSROOM
 GEOWRITE
 DOODLE
THIS AD CREATED WITH FGM

GEOS SCREENS CAN BE CAPTURED SIMPLY BY RESETTING
 COMPUTER THEN LOADING THE FUN GRAPHICS MACHINE.

FUN GRAPHICS MACHINE FULL KEYBOARD OVERLAY ---\$3.50 EA
 PLEASE STATE COMPUTER (C64, C128, SX-64) OR C64 IS SHIPPED

FUN GRAPHICS MACHINE DEMO DISK THIS IS A PREVIEW OF

WHAT FUN GRAPHICS MACHINE IS ALL ABOUT.....\$2.00

FOLLOWING DISKS REQUIRE THE FULL BLOWN VERSION OF FGM

FGM FONTS OVER 90 FONTS IN FGM FORMAT.....\$5.00

FGM CLIP ART VOL. 1 OVER 200 EXCELLENT GRAPHICS.....\$8.00

FGM CALENDAR TEMPLATE DAILY, WEEKLY, MONTHLY.....\$5.00

FGM OVERLAY TEMPLATE MAKE FULL KEYBOARD OVERLAYS

STATE COMPUTER FOR OVERLAY TEMPLATES OR C64 IS SENT---\$5.00

FGM UPDATE DISK V6.4 UPDATES FGM V6.x TO FGM V6.4---\$2.00

PLEASE ADD FOR SHIPPING AND HANDLING PER ORDER ---\$3.50

FOREIGN ORDERS: FOR AIR MAIL ADD ADDITIONAL AS FOLLOWS:

CANADA/MEXICO \$1.00, AUSTRALIA \$10.00, ALL OTHERS \$5.00

U.S. FUNDS ONLY SORRY NO CHARGE CARDS

The FGM Connection, P.O. Box 2206, Roseburg, OR. 97470

FOR MORE INFORMATION CALL 503-673-2234

NEW PRODUCTS From Makers of RAMDRIVE



BBG RAM

Battery Back-up
 Ram Disk for
 GEOS 2.0 and
 GEOS 128, 2.0

- Magnitudes faster than any floppy or hard drive
- 2 MEG model has capacity of TEN 1541's
- Includes GEOS application to select one of up to five 1571's
- Reboots GEOS from BBG Ram quickly and quietly
- Supplied with wall mount power supply and battery cable and holder
- Automatically detects power out and switches to back-up mode
- Activity light indicates access
- Battery used only when wall mount AC power supply off

MODEL 512

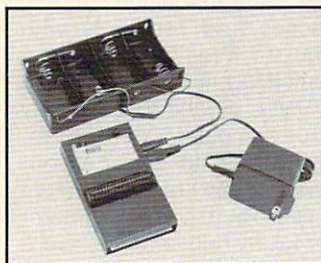
1 MEG

2 MEG

\$CALL

\$CALL

\$CALL



BBU

Battery Back-up
 Interface
 Module for
 Commodore
 17xx REU's and
 Berkley Softworks'
 GEORAM 512

- Reset button without data loss
- Activity indicator light during access
- Battery low voltage indicator
- Wall-mounted power supply and battery holder and cable supplied
- GEOS compatible, allows reboot to GEOS
- Automatic battery back-up, no switches to push
- Battery powers unit only when AC power off
- BBU supplies power to 17xx REU's and GEORAM. Commodore heavy power supply not required

FOR INFORMATION CALL **\$59.00**
 1-518-436-0485

Call: 1-800-925-9774

GEOS registered Trademark of Berkley Softworks, Inc.



Please Add:
 U.S. \$6.00 S&H
 Canada \$10.00 S&H
 \$4.00 C.O.D.

5 Upper Loudon Road
 Loudonville, New York 12211

PERFORMANCE
 PERIPHERALS Inc.

D'IVERSIONS

Fred D'Ignazio

HIS MASTER'S VOICE

When the phone rings and I answer, I sometimes get a peculiar or aggravating response. I might hear "Oh, hi, Janet! I was looking for Fred." (I have a high tenor voice, and callers frequently mistake me for a female.) My favorite is "Hi, honey. Is your mommy or daddy at home?"

Over the years, I've tried to change my telephone voice. The best I've managed to achieve is that of a feeble old man. But I shouldn't despair. Thanks to modern technology, I don't have to stick with my normal falsetto or toddler-like peep. Help is on the way.

A recent issue of *The Wall Street Journal* reported on a booming business in phone machines that electronically alter your voice. Security consultants are making a killing selling these machines to businesses and residents who want to alter their voice to something new.

Some machines are really voice computers. You can program them to change your voice into any of 250 different voices—from barroom brawler to violin virtuoso. If you are a person living alone or a security guard anchoring a company's graveyard shift, it's just the thing. You can make your voice so frightening and overpowering that even professional hit men would shiver at the sound of it.

Computerized voice boxes are still too expensive to be popping up in every home, but not for long. New, inexpensive voice chips are appearing, and high-speed digital signal processors (DSPs) and voice-compression algorithms are being perfected that will soon put synthetic speech inside every residential telephone for just pennies a pop.

Virtual voices may not have found their way into every home, but they have already taken over most offices. Company voice mail is a must for corporations which aim to survive lean-and-mean downsizing. Who hasn't called a company recently, only to tumble into the labyrinthine bowels of a computerized answering machine?

This is the way most user-friendly voice-mail systems handle customer calls.

"Hi, this is Fred D'Ig—"

"You have reached the Pygmy Bungee Jumping Society. If you have a rotary phone, please stay on the line, and an operator (at some far-off distance in the future) will (eventually) be on the line."

"But I just—"

"Press 1 if you wish to speak with customer services to order our new products. Press 2 if you would like our mail-order catalog. Press 3 for technical support. . . . Press 993 if you would like a salesman for our voice-mail company to pay you a visit. Press 994 if you would like to speak with our attorneys about suing us for the cruel and unusual punishment inflicted by this voice-mail message. Press . . ."

Think about it. Electronic voices may sound like science fiction, but they're also a very real part of life. During an average day, how many times do you talk to a computer or hear a computer's voice? Let's face it: Do you really know if there's a computer or a person at the other end of the line?

Computerized voices are not always a blight, either. Electronic voices are a godsend for visually handicapped people, for semiliterate and illiterate people, and for anyone who needs to keep his or her eyes on something else.

Here are some of the computer voices you are liable to hear during an average day.

- Your car nagging you to fasten your seat belt
- A digital telephone answering machine
- A talking clock
- A Jiminy Cricket watch
- A singing greeting card
- An electronic telephone operator
- Your electronic bank teller or stockbroker
- A computerized telephone salesperson
- Talking animatrons at Chuck E. Cheese, Disney World, and museums
- Videogames
- Home and automobile security systems
- An electronic conductor on a subway car
- Talking tech data computers in hospitals, labs, factories, and elsewhere

One of the geniuses of the computer revolution, Alan Turing, created a seemingly impossible intelligence test for computers over 50 years ago. He said computers would be truly intelligent when a human judge couldn't tell if he or she were conversing with a human or a computer.

Maybe we've already reached that point—and passed it.

How many robotlike waiters, bank tellers, telephone operators, and supermarket cashiers have you run into? In comparison, a computerized voice often sounds warm, friendly, and personable. The computer can sound truly human—something that people in rote, mechanical jobs have difficulty imitating.

On the other hand, even with the eclipse of the Cold War, we still may not survive the future. Instead of perishing through global holocaust, we may wink out slowly, one person at a time, through terminal boredom produced by listening to interminable computer phone messages! □

**Are you sure that
the voice you
hear on the phone
belongs to
a human being?**

PROGRAMS

ROGUE SUNBATHERS

By Alain Tremblay

The sun that shines on this distant planet is a potent and powerful source of energy. The natives of this planet take advantage of its power by erecting tall stone columns that they can use to bask in the rays high above the ground. Your task in this amusing one- or two-player game is to surpass the other sunbathers by building the tallest column.

Rogue Sunbathers is written entirely in machine language. To enter it, use MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following values.

Starting address: 0801
Ending address: 1838

Be sure to save a copy of the program before exiting MLX.

Playing the Game

At the start of the game, use the joystick to select how many computer opponents you wish to play against. You can select up to four. Also select the number of human players and the game's speed factor. Confirm each selection by pressing the fire button.

When the game begins, each player (including the computer opponents) starts at the foot of a short column. Move the joystick up and down to climb a column; move it left and right to run. You'll notice that each player has a distinctive hair color. This color matches a color bar at the bottom of the screen that indicates the status of that player's health.

Gather Rocks

Your first objective is to gather stones that you can pile on top of your column to make it higher. One way to get stones is to kick at an opponent's column. Stand beside a column, push the joystick button, and then move the joystick in the direction you want to kick. Keep pressing the joystick button.

If you're successful in your kick attempt, a stone will be freed from the base of the column. To pick it up, move to it and push the joystick up. The stone will disappear, but you'll notice that your movements are slightly

slower. Take the stone and climb to the top of your column where it will be automatically added.

To drop a stone, move the joystick down. Stones are also found just outside the left and right screen borders. Run until you almost leave the screen. Keep running even if you're not actually moving. You'll automatically pick up a stone after a short time. Take it back to your tower.

If a player builds a column taller than your own, you can climb to the top of it and kick several stones off. You can dislodge stones by pushing the joystick button and moving the stick left or right.

Be aware that the owner of a column objects to this behavior and has the right to push you off on your head. Each fall from the top of a column cuts your health by half. You won't be allowed to kick if your health status falls to 0.

You may recover and even gain extra health by climbing your column and sitting in the sun's powerful rays. Also, watch out for falling rocks. If a stone hits you on the head, it not only smashes you a little, but it's also harmful to your health.

The Winner

The game ends when the sun reaches the right side of the screen. The player with the tallest column wins. Health status is also taken into account for establishing the winner.

To change the game's color settings, type in the following POKes after loading the game but before running it. POKE 4390, X will change the border color. POKE 4391, X will change the screen color. POKE 2063, X will alter the stone color. For X, enter any Commodore color code number (0-15).

ROGUE SUNBATHERS

```
0801:0B 08 0A 00 9E 32 30 36 2E
0809:32 00 00 00 00 A9 08 8D 76
0811:21 D0 8D 86 02 A9 93 20 FD
0819:D2 FF 20 D9 10 20 92 12 6C
0821:A0 11 8C 13 D4 88 8C 14 7E
0829:D4 A9 27 8D 0D D4 A9 0F E9
0831:8D 18 D4 8D 03 D4 A9 7F BF
0839:8D 06 D4 A2 07 A9 0A 95 DE
0841:C0 CA 10 FB 20 1B 15 18 D5
0849:65 0A 0A 0A 85 FF A9 20 10
0851:E5 0C E5 0C E5 FF 85 06 15
0859:20 7B 13 20 6D 15 A4 0C D1
0861:98 0A AA A9 AF 9D 01 D0 F6
```

```
0869:A9 00 85 02 B9 00 9B 0A 2E
0871:0A 0A 26 02 69 1E 20 55 47
0879:10 A9 C0 99 F8 07 A9 02 E6
0881:99 27 00 88 10 DA 8C 15 CA
0889:D0 A6 0A 20 45 0E CA 10 F6
0891:FA 20 6F 09 20 89 14 20 15
0899:7D 15 A6 0C B5 80 F0 1E F2
08A1:86 FF A9 00 95 80 B4 C0 03
08A9:8A 18 69 14 AA 20 E1 14 21
08B1:A6 FF F6 C0 A9 44 91 D1 53
08B9:C0 27 D0 02 D6 C0 CA 10 8D
08C1:DB A5 3B C9 27 D0 C2 A6 D5
08C9:0C 86 94 B5 C0 A4 7D 20 B9
08D1:9B 9D 20 9B CA 10 F2 20 71
08D9:33 0B 98 09 30 8D 42 09 2F
08E1:C8 84 7F A0 08 A2 27 20 AA
08E9:EE 08 4C 3C 08 A9 00 85 2D
08F1:08 A5 08 10 FC BD 05 09 63
08F9:29 3F F0 07 99 C8 04 C8 BD
0901:E8 D0 F2 60 4E 55 4D 42 C4
0909:45 52 20 4F 46 20 43 4F D3
0911:4D 50 55 54 45 52 20 4F D0
0919:50 50 4F 4E 45 52 20 4F 95
0921:20 28 31 2D 34 29 3F 3A 45
0929:20 31 00 54 48 45 20 57 CB
0931:49 4E 4E 45 52 20 49 53 92
0939:20 50 4C 41 59 45 52 20 B1
0941:23 58 21 00 4E 55 4D 42 C3
0949:45 52 20 4F 46 20 50 4C 2B
0951:41 59 45 52 53 3A 20 31 1D
0959:00 53 50 45 45 44 20 46 60
0961:41 43 54 4F 52 28 31 2D 27
0969:34 29 3F 20 31 00 A6 0C AC
0971:E8 CA 86 FF 8A 0A 85 11 14
0979:E4 0A F0 87 D6 36 10 F1 B8
0981:A5 06 95 36 B4 50 F0 0A D0
0989:4A C0 04 B0 01 4A 75 36 CE
0991:95 36 B5 4B F0 05 20 19 5C
0999:0E D0 D6 B5 68 D0 D2 B5 FE
09A1:3C F0 0D D6 3C D0 CA B5 8D
09A9:58 F0 05 A9 C8 9D F8 07 15
09B1:B5 27 10 1F 4A 90 03 4C 43
09B9:73 0A B5 46 15 58 F0 2B 3A
09C1:B5 58 F0 03 20 91 0D B5 2A
09C9:60 C5 FF F0 0E 20 7A 0C 7E
09D1:4C 72 09 B5 50 F0 19 B5 51
09D9:46 F0 10 20 7E 0C B5 58 37
09E1:F0 06 A9 00 95 27 95 50 E7
09E9:4C 72 09 A4 FF 4C DB 0A 1D
09F1:B4 27 F0 2E 88 F0 7B B5 DD
09F9:46 F0 03 4C AC 0A B5 31 BA
0A01:C9 14 A9 FF 90 02 A9 01 15
0A09:85 02 20 A7 0E 20 96 0B 08
0A11:20 05 0B F0 07 A9 FF 85 4B
0A19:03 20 BC 0D 20 49 0B 4C A7
0A21:72 09 B5 C0 C9 04 90 0F 02
0A29:20 17 0B F0 2D 20 33 0B DE
0A31:D0 0B B9 20 9B C9 3C A9 CF
0A39:02 90 17 0B 1A B9 20 9B F3
0A41:4A DD 20 9B A9 01 B0 0A 6C
0A49:A5 08 C9 C0 A9 02 B0 02 30
0A51:A9 01 95 27 20 91 0D 4C 4D
0A59:72 09 B5 A0 D0 F9 B9 F8 84
0A61:07 C9 D0 A9 01 B0 02 A9 98
0A69:FF 85 02 A9 78 95 A0 4C 61
0A71:79 0F B5 46 15 58 F0 3E 4B
0A79:B4 60 C4 FF F0 2D B5 58 98
0A81:F0 19 B5 85 F0 0F A5 08 7A
0A89:29 0F D0 09 95 85 95 75 04
0A91:A9 02 4C 53 0A A9 01 95 48
```


PROGRAMS

```

0A99:85 D0 57 B9 8F 00 F0 07 90
0AA1:A9 02 95 27 4C 72 09 A9 18
0AA9:FF D0 02 A9 01 20 80 0C 62
0AB1:20 49 0B 4C 72 09 A5 3B 8C
0AB9:C9 23 B0 17 B4 75 F0 13 73
0AC1:B9 1F 9B 0A 85 FE 20 33 2A
0AC9:0B B9 20 9B C5 FE B4 75 98
0AD1:88 B0 07 20 33 0B D0 02 A2
0AD9:A0 00 B5 31 38 F9 00 B9 4D
0AE1:F0 19 C9 01 F0 15 0A A9 97
0AE9:01 B0 02 A9 FF 85 02 20 BF
0AF1:A7 0E 20 96 0B 20 49 0B 41
0AF9:4C 72 09 20 50 0D 20 49 34
0B01:0B 4C 72 09 A4 0C B5 31 80
0B09:38 F9 00 9B F0 07 C9 01 AB
0B11:F0 03 88 10 F1 60 A4 0C D8
0B19:B9 60 00 C5 FF D0 04 C4 90
0B21:FF D0 04 88 10 F2 60 B9 3B
0B29:58 00 19 46 00 F0 F4 A9 4A
0B31:00 60 A0 00 A6 0C B9 20 6C
0B39:9B DD 20 9B B0 02 8A A8 9D
0B41:CA 10 F3 A6 FF C4 FF 60 1D
0B49:20 17 0B D0 08 B5 8F F0 CA
0B51:04 A9 80 D0 1E A5 3B C9 B8
0B59:35 B0 16 B4 75 F0 2A B9 C1
0B61:8E 00 D0 25 B5 C0 C9 04 73
0B69:90 20 B9 1F 9B C9 03 90 93
0B71:E0 A9 81 95 27 A9 00 95 61
0B79:85 B5 50 F0 0C 20 05 0B CE
0B81:F0 07 A9 01 85 03 4C BC A4
0B89:0D 60 A9 02 95 27 B5 58 A0
0B91:F0 F7 4C 91 0D B5 C0 C9 4B
0B99:04 90 3B B5 58 D0 18 A4 73
0BA1:0C CA FF F0 2E B5 31 38 E0
0BA9:F9 00 9B C9 FF D0 04 A9 C1
0BB1:01 D0 06 C9 02 D0 1C A9 0F
0BB9:FF 85 02 B9 8A 00 D0 13 16
0BC1:C0 00 F0 05 A5 08 4A 90 19
0BC9:0A B9 10 9B C9 03 90 06 90
0BD1:4C 79 0F 88 10 CB 60 A0 E7
0BD9:00 AD 10 D0 3D 60 10 F0 E6
0BE1:08 BD 00 D0 C9 4C 90 09 22
0BE9:88 BD 00 D0 C9 0C B0 01 A1
0BF1:C8 60 A6 11 20 D8 0B 98 7D
0BF9:F0 1F 20 36 10 AD 12 D0 E3
0C01:29 0F D0 15 A6 FF 20 F4 47
0C09:0D A5 08 29 03 F0 04 C9 52
0C11:03 D0 02 A9 04 95 50 A6 77
0C19:11 38 AD 10 D0 3D 60 10 CA
0C21:D0 01 18 BD 00 D0 AA 6A C3
0C29:4A 4A A8 88 8A 29 04 D0 68
0C31:01 88 A6 FF 94 31 A6 11 88
0C39:BD 01 D0 48 29 07 AA 68 32
0C41:4A 4A A6 E0 05 E9 05 18 5A
0C49:69 01 A6 FF 95 2C 60 A8 F1
0C51:88 A9 CC 99 F8 07 BD F8 A3
0C59:07 C9 D0 A2 FF B0 02 A2 15
0C61:01 96 68 A2 00 96 98 96 F8
0C69:58 CA 96 C8 A6 FF A9 81 C9
0C71:8D 0B D4 A9 1E 8D 08 D4 54
0C79:60 A9 01 D0 02 A9 FF 85 95
0C81:03 DE 00 80 30 03 4C 4D 4E
0C89:0D A9 02 9D 00 80 A4 11 09
0C91:A5 03 18 79 01 D0 99 01 57
0C99:D0 38 E9 AF 90 07 A9 00 54
0CA1:95 46 4C 4D 0D 49 FF 69 6B
0CA9:00 B4 60 38 F9 20 9B B0 B6
0CB1:03 4C 45 0D 18 A4 11 79 C6
0CB9:01 D0 99 01 D0 B4 60 B9 9D
0CC1:8F 00 F0 17 C4 FF F0 0E 47
0CC9:A6 11 FE 01 D0 A6 FF A9 34
0CD1:02 95 27 4C 4D 0D 20 50 29
0CD9:0C B4 60 A9 00 85 02 95 7B
0CE1:46 E8 8A CA 99 8F 00 95 F5
0CE9:58 A6 11 B9 00 9B 0A 0A 22
0CF1:0A 26 02 69 14 20 55 10 4B
0CF9:A6 FF B5 50 F0 42 B9 20 45
0D01:9B 30 3D 98 0A 0A 0A BC
0D09:0A 79 10 9B A8 B5 50 99 98
0D11:00 9C C9 04 C8 A9 00 99 52
0D19:00 9C 95 50 A9 04 90 01 91
0D21:0A 85 02 A4 11 B9 01 D0 6E
0D29:38 E5 02 99 01 D0 B5 60 C9
0D31:AA 20 21 14 A9 81 8D 12 8E
0D39:D4 A9 20 8D 0F D4 A6 FF 1E
0D41:A9 C8 D0 05 BD F8 07 49 F5
0D49:07 9D F8 07 4C F3 0B 94 BA
0D51:60 85 FE A6 11 DE 01 D0 1E
0D59:A9 00 85 02 B9 00 9B A4 C2
0D61:FE 0A 0A 0A 26 02 69 08 73
0D69:26 02 C0 01 D0 02 69 17 B7
0D71:20 55 10 98 0A 0A 0A 13
0D79:09 C3 A6 FF 95 46 4C CB 08
0D81:0E B5 46 F0 03 4C 82 0C 42
0D89:B5 58 F0 2A A5 03 30 BC AB
0D91:B4 60 B9 20 9B C9 08 90 FB
0D99:02 A9 08 18 A4 11 79 01 FE
0DA1:D0 99 01 D0 A9 00 95 58 88
0DA9:B4 60 99 8F 00 C6 02 30 B1
0DB1:9E A9 01 4C 50 0D 20 05 66
0DB9:0B F0 94 B4 31 B5 2C AA D6
0DC1:20 E1 14 A6 FF A5 03 10 FD
0DC9:39 B5 50 D0 23 B1 D1 4A D2
0DD1:90 01 88 0A 84 FE A0 04 8B
0DD9:D9 2F 10 F0 05 88 D0 F8 A2
0DE1:F0 0E 94 50 A9 20 A4 FE A5
0DE9:91 D1 C8 91 D1 20 F4 0D 79
0DF1:4C F3 0B BD F8 07 29 10 B2
0DF9:09 CB 9D F8 07 A9 1E 95 7F
0E01:41 60 B4 50 F0 EA B9 2F 47
0E09:10 B4 31 91 D1 C8 09 01 5E
0E11:91 D1 A9 00 95 50 F0 D5 45
0E19:10 1E 9D F8 07 56 C0 8A A5
0E21:18 69 14 B4 C0 AA 20 E1 44
0E29:14 A9 20 91 D1 C8 C0 27 31
0E31:D0 F9 A6 FF 94 4B 16 4B 52
0E39:D6 4B D0 05 A9 C0 9D F8 82
0E41:07 4C F3 0B 86 FF 86 11 75
0E49:06 11 D6 36 10 F3 A5 06 8C
0E51:95 36 B4 50 F0 0A 4A C0 66
0E59:04 90 01 4A 75 36 95 36 46
0E61:B5 68 D0 69 B5 4B D0 B0 50
0E69:B5 3C F0 0C D6 3C D0 5D F4
0E71:B5 58 F0 04 A9 C8 D0 52 41
0E79:B5 41 F0 04 D6 41 D0 4D C9
0E81:20 7D 10 8A A6 FF A8 D0 0F
0E89:03 4C 59 0F A5 03 F0 03 74
0E91:4C 82 0D B5 46 15 58 D0 79
0E99:34 A5 02 D0 09 BD F8 07 BE
0EA1:29 11 09 C0 D0 24 A6 11 39
0EA9:20 36 10 A6 FF B4 B8 BD D1
0EB1:F8 07 D6 70 F0 0B A9 03 F0
0EB9:95 70 C8 98 29 03 A8 9A 9A
0EC1:B8 B9 70 10 A4 02 10 02 07
0EC9:49 10 9D F8 07 4C F3 0B 2E
0ED1:A0 07 B9 68 00 F0 08 88 1A
0ED9:C0 04 D0 F6 4C F3 0B 84 AD
0EE1:FE B4 60 B9 8A C0 D0 E5 2E
0EE9:D5 C0 D0 03 4C 25 10 E8 5B
0EF1:96 75 CA 98 0A 0A 0A 0A 30
0EF9:0A 79 10 9B A8 29 1F C9 27
0F01:02 90 72 B9 FF 9B C9 04 34
0F09:A9 05 B0 02 A9 03 99 FF FF
0F11:9B B4 60 99 8A 00 18 69 BD
0F19:CA A6 FE 9D F8 07 A5 02 31
0F21:95 68 A9 41 95 98 A9 01 D0
0F29:95 C8 8A 0A AA A4 11 B9 F9
0F31:00 D0 9D 00 D0 B9 01 D0 77
0F39:9D 01 D0 20 4B 10 AD 10 88
0F41:D0 39 60 10 F0 03 20 3F 36
0F49:10 A9 81 8D 0B D4 A9 0C ED
0F51:8D 08 D4 A6 FF 4C 0E 10 9A
0F59:B5 46 D0 19 BD F8 07 A8 18
0F61:29 0F C9 09 F0 12 A5 02 BE
0F69:F0 03 4C 8D 0E 98 29 10 58
0F89:09 C9 9D F8 07 4C 22 10 87
0F79:A0 10 A5 02 F0 F7 30 02 8A
0F81:A0 00 98 85 FE 09 CA 9D AA
0F89:F8 07 A9 1E 95 3C B5 58 5E
0F91:F0 03 4C D1 0E A4 0C B5 60
0F99:31 F9 00 9B C9 FF D0 08 80
0FA1:A5 FE D0 D1 A9 03 D0 0F 93
0FA9:C9 02 F0 05 88 10 E8 30 22
0FBL:70 A5 FE F0 6C A9 FC 18 7C
0FB9:75 31 85 FE B9 8A 00 D0 48
0FCL:60 B9 10 9B C9 01 F0 59 C7
0FC9:84 FD B5 C0 F0 56 B5 2C E4
0FD1:8E 96 75 AA A4 FE 20 E1 A6
0FD9:14 A5 FD 0A 0A 0A 0A 62
0FE1:AA BD 00 9C A4 0D 99 8A 69
0FE9:00 A8 C9 04 A9 05 B0 02 70
0FF1:A9 03 9D 00 9C B9 2F 10 93
0FF9:A4 FE 91 D1 09 01 C8 91 E8
1001:D1 A9 81 8D 0B D4 A9 08 84
1009:8D 08 D4 A6 FF B4 C0 88 D3
1011:94 C0 8A 18 69 14 AA 20 8F
1019:E1 14 A9 20 91 D1 98 F0 5C
1021:03 4C F3 0B A9 C2 95 4B D3
1029:A9 06 85 0F 4C F3 0B 40 C9
1031:42 00 44 A5 02 18 7D 00 C0
1039:D0 9D 00 D0 D0 08 AD 10 48
1041:D0 1D 60 10 D0 0A C9 FF 60
1049:D0 09 AD 10 D0 3D 61 10 19
1051:8D 10 D0 60 26 02 9D 00 D0
1059:D0 A5 02 F0 ED 00 DF 01 0E
1061:FE 02 FD 04 FB 08 F7 10 81
1069:EF 20 DF 40 BF 80 7F C5 4E
1071:C8 C7 C6 A0 07 0A B0 03 8E
1079:88 D0 FA 60 BD 00 DC A2 C1
1081:01 A0 00 94 02 4A B0 02 30
1089:D0 02 4A B0 02 F6 02 CA A4
1091:10 EF 4A A5 0D B0 04 10 9C
1099:01 E8 60 86 0D 60 A5 0C 2A
10A1:18 69 15 85 FF A2 14 A0 76
10A9:00 20 E1 14 98 D5 AC A9 6E
10B1:44 90 02 A9 20 91 D1 A5 83
10B9:D1 85 D3 A5 D2 18 69 D4 97
10C1:85 D4 BD 13 D0 C0 20 90 1D
10C9:02 A9 02 91 D3 C8 C0 28 1A
10D1:D0 DA E8 E4 FF D0 D0 60 C1
10D9:78 A9 33 85 01 D2 00 BD AF
10E1:00 D0 9D 00 38 BD 00 D1 74
10E9:9D 00 39 BD D7 15 9D 00 2A
10F1:3A CA D0 EB A9 36 85 01 EC
10F9:A9 11 8D 15 03 A9 35 8D EC
1101:14 03 A2 1E A9 00 9D 00 AC
1109:D4 BD 16 11 9D 10 D0 CA 72
1111:D0 F2 86 0F 58 60 1B 00 94
1119:00 00 FF C8 00 1E 00 00 40
1121:00 1F 00 00 00 F6 F6 00 D4

```


1129:00	00	F9	F0	F7	F0	F1	F5	F6	1359:85	02	8A	29	55	0A	05	02	85	1589:B5	68	F0	43	C9	80	F0	3F	6C
1131:F4	F8	F8	F8	A9	80	8D	0B	30	1361:91	24	E6	22	C6	24	C6	03	AF	1591:B5	98	38	F5	C8	95	98	10	01
1139:D4	8D	12	D4	A6	0C	B5	A0	2A	1369:D0	D7	A5	24	18	69	06	85	DC	1599:04	A0	01	94	C8	20	74	10	17
1141:F0	02	D6	A0	CA	10	F7	AD	75	1371:24	C6	04	D0	C8	C6	05	D0	25	15A1:98	D5	A8	F0	0D	95	A8	8A	4C
1149:1E	D0	C9	20	90	38	A2	FF	94	1379:A5	60	20	F0	14	A0	27	A9	B8	15A9:0A	A8	B9	01	D0	75	C8	99	D1
1151:E0	03	F0	32	4A	E8	85	07	ED	1381:46	99	D0	06	A9	05	99	D0	11	15B1:01	D0	D6	B0	10	10	A9	05	8F
1159:90	F6	B4	4B	D0	F2	B4	46	CE	1389:DA	88	10	F3	8C	0F	D4	A6	71	15B9:95	B0	8A	A8	0A	AA	B9	68	8D
1161:F0	EE	B4	60	B9	A0	00	F0	95	1391:0C	86	FF	AC	1B	D4	C0	27	FE	15C1:00	20	36	10	98	AA	B4	98	2D
1169:19	8A	D5	60	F0	14	A9	C2	69	1399:0C	F9	C0	07	90	F5	A2	02	C2	15C9:C8	D0	04	A9	80	95	68	CA	9D
1171:95	4B	A9	06	85	0F	8A	0A	4E	13A1:20	E1	14	A2	07	B1	D1	C9	69	15D1:10	B6	60	00	00	00	00	00	BD
1179:A8	A9	AF	99	01	D0	A9	00	88	13A9:20	D0	E8	88	CA	D0	F6	C8	0A	15D9:00	00	00	1F	3F	1F	00	00	6C
1181:95	46	A5	07	D0	CA	E6	08	AC	13B1:C8	C8	A6	FF	98	9D	00	9B	1A	15E1:00	00	00	7C	FE	BC	00	00	BE
1189:D0	18	A5	94	D0	14	A4	3B	73	13B9:8A	0A	0A	0A	0A	0A	69	60	35	15E9:00	00	00	1F	7F	3B	00	00	EE
1191:A9	20	99	00	04	A9	44	C8	DB	13C1:85	02	A9	10	85	03	A5	02	E6	15F1:00	00	00	D8	FC	0F	00	07	5C
1199:99	00	04	A9	07	99	00	D8	1B	13C9:91	D1	18	69	10	C8	91	D1	5F	15F9:1F	0D	1F	1F	1F	0D	00	E0	DA
11A1:84	3B	A5	08	29	3F	D0	11	03	13D1:E6	02	A6	D6	E8	88	20	E1	B9	1601:F8	F8	78	B8	F8	E0	5C	FF	86
11A9:A4	7F	F0	0D	88	98	0A	AA	52	13D9:14	C6	03	D0	E9	C6	FF	10	A3	1609:00	00	00	00	00	00	FB	07	34
11B1:AD	15	D0	5D	60	10	8D	15	53	13E1:B2	A4	0C	98	0A	0A	0A	2C		1611:0A	80	00	0B	00	00	09	00	25
11B9:D0	A5	08	0A	D0	3C	A6	0C	20	13E9:0A	AA	A9	0F	85	03	A9	04	75	1619:00	05	00	00	04	00	00	55	FB
11C1:F6	7A	A4	3B	C0	12	90	0D	C2	13F1:85	02	D0	0F	C6	02	F0	15	9B	1621:00	01	55	00	01	55	40	01	17
11C9:C0	16	B0	09	F6	7A	F6	7A	82	13F9:AD	1B	D4	29	03	F0	F5	C9	7C	1629:14	40	01	14	40	00	55	00	7D
11D1:A9	02	99	FF	D7	8A	0A	8A	22	1401:03	D0	02	A9	04	9D	00	9C	EC	1631:00	3C	00	00	1C	00	00	14	61
11D9:B9	01	D0	38	E9	2C	20	74	6B	1409:E8	C6	03	D0	EB	A9	00	9D	68	1639:00	00	14	00	00	14	00	00	38
11E1:10	98	D5	7A	B0	11	8A	F5	49	1411:00	9C	88	10	CE	A6	0C	20	BB	1641:14	00	00	14	FB	27	2A	00	89
11E9:60	D0	0C	B5	58	15	46	F0	E1	1419:21	14	CA	10	FA	4C	9F	10	89	1649:00	2C	00	00	24	00	00	14	B5
11F1:06	95	80	A9	00	95	7A	CA	3D	1421:86	0E	8A	0A	0A	0A	0A	98		1651:00	00	10	00	00	54	00	01	D1
11F9:10	C6	A5	08	29	07	D0	03	15	1429:85	FE	A5	0E	69	3B	85	23	CF	1659:55	00	05	FD	40	01	75	FB	9D
1201:8D	88	14	A6	0C	DE	00	9A	71	1431:85	25	A9	00	85	22	85	FD	58	1661:07	08	00	00	08	00	0A	88	EF
1209:D0	25	AD	12	D0	29	1F	09	28	1439:A9	80	85	24	A0	7F	A6	FE	98	1669:00	0B	08	00	09	08	00	05	C6
1211:08	9D	00	9A	BD	F8	07	A8	D2	1441:A9	04	85	0B	BD	00	9C	F0	B8	1671:08	00	04	08	00	15	08	00	07
1219:29	0F	C9	08	F0	06	C9	02	84	1449:21	AA	BD	82	14	E0	04	AA	63	1679:15	14	00	15	50	00	15	40	73
1221:90	07	D0	0B	98	49	10	D0	F4	1451:90	02	06	0B	BD	00	3A	91	A7	1681:00	05	00	00	0F	50	00	0D	B5
1229:03	98	49	01	9D	F8	07	CA	D7	1459:22	BD	08	3A	91	24	CA	88	E1	1689:50	00	02	14	00	02	04	00	6F
1231:10	D3	A2	07	B5	68	C9	80	7A	1461:E6	FD	C6	00	0D	EE	E6	FE	15	1691:02	00	00	00	00	00	00	00	4F
1239:D0	24	8A	0A	A8	B9	01	D0	BF	1469:D0	D4	A9	00	91	22	91	24	C0	1699:00	00	00	00	A0	FB	04	08	CC
1241:69	01	99	01	D0	C9	AF	D0	7B	1471:88	10	F9	A6	0E	A5	FD	9D	2C	16A1:00	0A	88	00	0B	08	00	09	E2
1249:15	A9	00	95	68	E0	05	90	1D	1479:20	9B	A5	FE	29	1F	9D	10	4E	16A9:08	00	05	04	00	04	14	00	F2
1251:05	99	01	D0	B0	08	A9	C2	47	1481:9B	60	07	17	3F	27	3F	00	F6	16B1:05	50	00	15	40	00	15	80	72
1259:95	4B	A9	06	85	0F	CA	10	BE	1489:AD	88	14	D0	38	A6	0C	8E	3D	16B9:00	55	00	00	55	00	00	15	FA
1261:D3	A6	F0	30	0E	BD	7A	12	6C	1491:88	14	B5	8A	F0	2C	8A	0A	B9	16C1:10	00	0F	54	00	0D	44	00	D9
1269:8D	01	D4	BD	81	12	8D	04	7E	1499:0A	0A	0A	0A	A8	B9	00	9C	F3	16C9:09	40	00	08	50	00	08	10	AD
1271:D4	C6	0F	AD	0D	DC	4C	81	64	14A1:F0	1D	C9	05	F0	04	C9	03	41	16D1:00	02	10	00	02	00	00	08	98
1279:EA	00	02	07	02	07	08	10	10	14A9:D0	12	85	FF	B9	01	9C	99	14	16D9:00	00	20	FB	09	0A	80	00	3B
1281:10	41	21	41	11	41	11	A8	8E	14B1:00	9C	95	8A	F0	10	A5	FF	6F	16E1:0B	00	00	09	00	00	05	00	2E
1289:00	00	38	00	00	18	00	00	15	14B9:99	01	9C	8C	C8	D0	DE	20	76	16E9:00	04	00	00	55	40	00	55	18
1291:14	A9	0F	85	22	A9	16	85	CD	14C1:21	14	CA	10	CD	60	B5	8F	C4	16F1:40	01	55	00	01	14	40	01	03
1299:23	A9	30	8D	BD	12	A2	00	14	14C9:F0	F5	38	E9	01	0A	A8	A5	B4	16F9:14	50	00	54	00	00	F0	00	6B
12A1:A0	00	A9	01	85	FF	B1	22	0D	14D1:FF	C9	05	A9	04	90	01	0A	16	1701:00	70	00	01	54	00	01	04	04
12A9:C8	D0	02	E6	23	C9	FB	D0	1E	14D9:79	01	D0	99	01	D0	D0	DF	7F	1709:00	04	04	00	00	04	00	00	C8
12B1:09	B1	22	85	FF	F0	12	C8	14	14E1:BD	00	9F	85	D1	BD	20	9F	9A	1711:04	FB	0C	0A	80	00	0B	00	7C
12B9:A9	00	9D	40	30	E8	D0	03	34	14E9:85	D2	86	D6	84	D3	60	A2	9E	1719:00	09	00	00	05	00	00	04	B5
12C1:EE	BD	12	C6	FF	D0	F3	F0	97	14F1:00	A9	20	9D	00	04	9D	00	AD	1721:00	00	15	00	00	55	00	00	47
12C9:D9	A2	3E	A0	00	BD	40	30	FC	14F9:05	9D	00	06	9D	E7	06	E8	ED	1729:55	00	00	55	40	00	55	40	44
12D1:9D	00	30	BD	00	32	99	00	A2	1501:D0	EF	8A	A0	04	9D	00	9F	21	1731:00	14	00	00	3C	00	00	1C	62
12D9:33	A9	00	9D	40	33	9D	C0	A6	1509:18	69	28	48	98	9D	20	9F	3E	1739:00	00	14	00	00	14	00	00	3A
12E1:33	C8	CA	10	E8	A2	09	BD	CD	1511:68	90	01	C8	E8	E0	1A	D0	10	1741:50	00	00	10	00	00	10	FB	B4
12E9:88	12	9D	07	30	CA	10	F7	BF	1519:EC	60	A2	00	A0	79	20	EE	40	1749:0C	0A	80	00	0B	00	00	09	71
12F1:A0	00	A2	07	BD	00	3A	99	27	1521:08	20	3E	15	85	0C	A2	40	52	1751:00	00	05	00	00	04	00	00	30
12F9:67	33	BD	08	3A	99	68	33	13	1529:A0	A9	20	EE	08	A9	01	20	0A	1759:55	00	00	55	00	01	55	10	46
1301:BD	20	3A	99	E7	33	BD	28	9E	1531:40	15	85	0A	C6	A0	A2	55	0B	1761:01	15	50	01	15	40	00	14	2D
1309:3A	99	E8	33	C8	C8	C8	CA	C8	1539:A0	D1	20	EE	08	A9	03	85	8D	1769:00	00	F0	00	00	74	00	01	88
1311:10	E2	A9	10	85	05	A9	C0	82	1541:0D	85	FE	84	FF	A												

PROGRAMS

```

17B9:15 00 00 55 40 00 55 40 B4
17C1:01 54 40 01 14 50 01 14 95
17C9:00 00 3C 00 00 1C 00 00 EF
17D1:15 00 00 05 00 00 05 00 E4
17D9:00 14 00 00 04 FB 0C A8 DD
17E1:00 00 B0 00 00 90 00 00 68
17E9:50 00 00 40 00 00 54 00 EC
17F1:01 55 00 05 51 50 04 50 6A
17F9:00 10 54 00 10 14 00 00 87
1801:3D 50 00 1F 55 00 14 00 A8
1809:00 04 00 00 04 00 00 10 6A
1811:00 00 10 FB 24 14 00 00 74
1819:55 A0 03 55 60 03 D4 60 EA
1821:01 44 20 00 55 00 00 51 E2
1829:00 00 50 00 01 44 00 01 7D
1831:04 FB 05 FB 00 00 00 00 C2

```

Alain Tremblay does his sunbathing in Sainte-Foy, Quebec, Canada.

SPACE TREK

By Bob Yu

The space adventure continues with Space Trek. Boldly go where no computer has gone before in this fast-paced, one- or two-player arcade-style game for the 64.

As captain of a space vessel, you have a mission to explore the final frontier of space. Your mission for this part of the adventure is to guide your ship through dangerous asteroid fields to reach the other side of the Alpha sector.

Getting Started

Space Trek is written entirely in machine language. To enter the program, use MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following values.

Starting address: 0801

Ending address: 1638

Be sure to save a copy of the program before exiting MLX.

Playing the Game

Space Trek loads and runs like a BASIC program. At the menu prompt, move joystick 1 left for a one-player game or right for a two-player game. Your task is to guide your ship through an asteroid belt, trying to avoid collisions. Your shields have only enough power to resist three hits from the asteroids. You can either fly around the asteroids or destroy them with blasts from your ship's phaser. Also be

on the alert for enemy ships.

Control your ship with either the keyboard or joystick. Joysticks are required for the two-player game. Use a joystick to guide your ship left or right, and press the fire button to launch a phaser blast. From the keyboard, move your ship to the right by pressing the 2 key. Press Ctrl to move to the left. Press the space bar to fire the ship's phaser. Press the Commodore key to pause the game and then press the Shift key to resume play.

Game levels are determined by the length of time you successfully avoid collisions. At higher levels your ship will increase its speed. There are six levels in all. Watch out for the last level; it's a killer.

Scoring

Each rock that you hit with your phaser earns you 150 points. You earn 250 points for hitting an enemy ship. Nothing will shoot at you, but watch out for those fast-approaching rocks. Each asteroid hit causes you to lose one shield factor. Warning: this game may look simple, but it's addictive.

SPACE TREK

```

0801:0B 08 0A 00 9E 32 30 36 2E
0809:31 00 00 00 20 9F 08 20 61
0811:7D 0A 20 44 E5 20 7D 0A 5F
0819:20 E5 0D 20 C8 13 20 7D A6
0821:0A 20 E9 12 20 90 0B 20 16
0829:2F 12 20 09 12 A9 00 85 A6
0831:A1 20 AA 0B 20 CA 0B AD 10
0839:15 D0 29 01 F0 03 20 EA FB
0841:0B AD 15 D0 29 04 F0 03 30
0849:20 1B 0C 20 B1 0D 20 CB 81
0851:0D 20 4C 0C 20 7A 0C 20 5D
0859:A8 0C 20 C3 0E 20 31 10 64
0861:20 3B 13 20 E0 0F 20 A6 DE
0869:0E 20 B0 13 AD C7 13 18 9A
0871:69 F9 AA 20 9D 0B A5 A1 12
0879:48 AD 8D 02 C9 02 D0 07 E9
0881:AD 8D 02 C9 01 D0 F9 68 50
0889:85 A1 AD C7 13 C9 06 D0 93
0891:03 4C 59 14 AD 15 D0 29 2F
0899:05 D0 96 4C 19 08 A2 00 26
08A1:BD BA 08 9D 00 30 E8 E0 8D
08A9:00 D0 F5 A2 00 BD BA 09 4C
08B1:9D 00 31 E8 E0 C0 D0 F5 E6
08B9:60 00 20 00 00 20 00 00 7E
08C1:A8 00 00 A8 00 00 A8 00 02
08C9:00 A8 00 00 A8 00 00 A8 F1
08D1:00 00 A8 00 02 AA 00 02 B3
08D9:AA 00 0A AA 80 0A AA 80 2D
08E1:00 30 00 00 FC 00 00 FC E2
08E9:00 00 FC 00 00 FC 00 00 8D
08F1:FC 00 00 30 00 00 00 00 83
08F9:00 00 20 00 00 20 00 00 8E
0901:A8 00 00 A8 00 00 A8 00 43

```

```

0909:00 A8 00 00 A8 00 00 A8 33
0911:00 00 A8 00 02 AA 00 02 F4
0919:AA 00 0A AA 80 0A AA 80 6E
0921:00 30 00 00 FC 00 00 FC 24
0929:00 00 30 00 00 00 00 00 41
0931:00 00 00 00 00 00 00 00 43
0939:00 00 00 00 00 20 00 02 CD
0941:A8 20 28 AA A0 23 A8 20 62
0949:2B E8 AA 2F 2E A2 AB 03 C9
0951:88 8E EF AA BF FF 22 2E 64
0959:FB FA BE CE CA AF 83 02 0B
0961:83 E3 28 BA A3 F8 FF 87 67
0969:A8 2E 8E 88 0A 2A A0 0C FB
0971:82 80 00 28 00 00 00 00 67
0979:00 00 00 00 00 20 00 02 0E
0981:A8 00 08 A2 00 03 8A 00 34
0989:0B EE 80 0E 2F 80 2B F2 92
0991:80 2E FF 80 2A FE 80 08 CD
0999:EE 80 0A EA 00 02 A8 00 8C
09A1:00 80 00 00 00 00 00 00 D3
09A9:00 00 00 00 00 00 00 00 BB
09B1:00 00 00 00 00 00 00 00 C3
09B9:00 00 20 00 08 20 00 08 98
09C1:00 08 82 22 08 20 28 80 D9
09C9:2B B2 80 02 BF 80 22 FF 92
09D1:00 28 2C 00 0B FA 80 83 3C
09D9:F8 28 83 A2 80 02 38 00 89
09E1:02 22 80 08 02 A0 A0 20 02
09E9:20 20 20 28 00 00 00 00 9A
09F1:00 00 00 00 00 00 00 00 04
09F9:00 00 00 00 00 00 00 00 0C
0A01:00 00 00 00 00 00 14 00 3D
0A09:00 55 00 01 55 40 2A 55 D7
0A11:A8 AA AA AA AA AA A0 02 7B
0A19:FF 80 00 3C 00 00 00 00 11
0A21:00 00 00 00 00 00 00 00 35
0A29:00 00 00 00 00 00 00 00 3D
0A31:00 00 00 00 00 00 00 00 45
0A39:00 00 00 00 00 20 00 00 CD
0A41:20 00 00 20 00 00 20 00 A7
0A49:00 20 00 00 20 00 00 20 86
0A51:00 00 20 00 00 00 00 00 69
0A59:00 00 00 00 00 00 00 00 6D
0A61:00 00 00 00 00 00 00 00 75
0A69:00 00 00 00 00 00 00 00 7D
0A71:00 00 00 00 00 00 00 00 85
0A79:00 00 00 00 A9 00 8D 21 17
0A81:D0 8D 20 D0 A9 01 8D 86 65
0A89:02 A9 8E 20 16 E7 A9 08 88
0A91:20 16 E7 20 66 E5 A0 00 46
0A99:A9 07 8D D0 0A A2 00 A9 87
0AA1:00 8D CF 0A A9 1D 20 16 CB
0AA9:E7 DE CF 0A AD CF 0A C9 92
0AB1:21 D0 F1 BD D1 0A 20 16 B1
0AB9:E7 E8 EC D0 0A D0 F4 AD D1
0AC1:D0 0A 18 69 07 8D D0 0A 74
0AC9:C8 C0 17 D0 D2 60 00 7A
0AD1:20 53 50 41 43 45 20 20 78
0AD9:20 54 52 45 4B 20 20 20 EC
0AE1:20 20 20 20 20 20 20 20 F5
0AE9:20 20 20 20 4C 45 56 45 85
0AF1:4C 3A 30 20 20 20 20 20 A4
0AF9:20 20 50 4C 41 59 45 52 41
0B01:31 20 53 43 4F 52 45 20 C4
0B09:30 30 30 30 30 30 30 30 0F
0B11:20 20 20 20 20 20 20 20 5A
0B19:48 49 45 4C 44 20 20 20 16
0B21:33 20 20 20 20 20 20 20 C0
0B29:20 20 20 50 4C 41 59 45 BF
0B31:52 32 20 53 43 4F 52 45 77

```


0B39:20 30 30 30 30 30 30 30 47 0D69:0D D0 C0 FE D0 08 A9 17 57 0F99:AF 0F AD D3 0F C9 01 F0 D8
0B41:20 20 20 20 20 20 20 20 57 0D71:8D 0D D0 8D AF 0D AD AC 42 0FAL:0A A9 01 8D D3 0F E8 C8 9D
0B49:53 48 49 45 4C 44 20 20 6C 0D79:0D C9 01 D0 13 AE 0E D0 F9 0FA9:4C AF 0F A9 01 60 BD 00 5B
0B51:20 33 20 20 20 20 20 20 2C 0D81:CA 8E 0E D0 E0 00 D0 08 24 0FBI:D0 D9 00 D0 F0 E4 90 0B 03
0B59:20 20 20 20 50 52 4F 47 3F 0D89:A9 00 8D 0F D0 8D AC 0D 3E 0FBB:F9 00 D0 CD D2 0F 90 DA 9A
0B61:52 41 4D 20 20 42 59 20 79 0D91:AD AC 0D C9 02 D0 13 AE 14 0FC1:A9 00 60 B9 00 D0 FD 00 9B
0B69:20 20 42 4F 42 20 59 55 6F 0D99:0E D0 E8 8E 0E D0 E0 FF 6A 0FC9:D0 CD D2 0F 90 CC A9 00 1A
0B71:20 A9 FF 8D 0F D4 A9 FF F9 0DA1:D0 08 A9 00 8D 0F D0 8D 33 0FD1:60 00 00 00 00 00 00 00 20
0B79:8D 18 D4 A9 81 8D 12 D4 CC 0DB1:AD F8 07 C9 C0 D0 06 A9 5D 0FD9:00 00 00 00 00 00 00 AD A5
0B81:AD 1B D4 C9 18 90 EA 48 8D 0DB9:C1 8D F8 07 60 AD F8 07 5A 0FE1:D6 0F F0 05 A0 96 20 5A 97
0B89:A9 00 8D 12 D4 68 60 A2 F2 0DC1:C9 C1 D0 05 A9 C0 8D F8 FF 0FE9:0E AD D7 0F F0 05 A0 96 D9
0B91:00 A9 00 9D 00 D4 E8 E0 F1 0DC9:07 60 AD FA 07 C9 C0 D0 96 0FF1:20 5A 0E AD D8 0F F0 05 3D
0B99:18 D0 F6 60 A0 00 C8 C0 2C 0DD1:06 A9 C1 8D FA 07 60 AD CC 0FF9:A0 96 20 5A 0E AD D9 0F A1
0BA1:C8 D0 FB E8 E0 FF D0 F4 FB 0DD9:FA 07 C9 C1 D0 05 A9 C0 37 1001:F0 05 A0 FA 20 5A 0E AD D2
0BA9:60 AD 01 DC 29 0F AE 00 2B 0DE1:8D FA 07 60 A2 00 A9 00 D0 1009:DA 0F F0 05 A0 96 20 80 E8
0BB1:D0 C9 0B D0 06 CA E0 18 46 0DE9:9D 00 D0 E8 E0 10 D0 F6 5B 1011:0E AD DB 0F F0 05 A0 96 83
0BB9:D0 01 E8 C9 07 D0 06 E8 A2 0DF1:8D 17 D0 8D 1B D0 8D 1D DF 1019:20 80 0E AD DC 0F F0 05 10
0BC1:E0 FF D0 01 CA 8E 00 D0 D3 0DF9:D0 A9 F0 8D 15 D0 A9 FF 1D 1021:A0 96 20 80 0E AD DD 0F 35
0BC9:60 AD 00 DC 29 0F AE 04 30 0E01:8D 1C D0 A9 01 8D 25 D0 F8 1029:F0 05 A0 FA 20 80 0E 60 46
0BD1:D0 C9 0B D0 06 CA E0 18 66 0E09:A9 02 8D 26 D0 A2 00 A9 49 1031:A2 00 A0 00 20 4B 10 E8 ED
0BD9:D0 01 E8 C9 07 D0 06 E8 C2 0E11:03 9D 27 D0 E8 E0 07 D0 B1 1039:A0 02 20 4B 10 CA 20 A4 73
0BE1:E0 FF D0 01 CA 8E 04 D0 FB 0E19:F6 A9 01 8D 28 D0 8D 2A DD 1041:10 E8 E0 03 D0 F8 20 27 C1
0BE9:60 AD 01 DC 29 10 C9 00 A6 0E21:D0 A9 0D 8D 29 D0 A9 C0 2B 1049:11 60 BD 7F 11 D0 1F BD 81
0BF1:D0 26 AD 1A 0C C9 00 D0 A9 0E29:8D F8 07 8D FA 07 A9 C6 12 1051:DE 0F F0 4E A9 01 9D 7F B3
0BF9:1F AD 00 D0 8D 02 D0 A9 D7 0E31:8D F9 07 8D FB 07 A9 C2 5E 1059:11 98 48 8A 48 A0 81 A9 4B
0C01:C3 8D 03 D0 A0 11 A9 28 90 0E39:8D FC 07 8D FD 07 8D FE 3B 1061:02 20 A3 12 20 C6 12 68 C8
0C09:20 A3 12 A9 01 8D 1A 0C 75 0E41:07 A9 C5 8D FF 07 A9 50 9C 1069:AA 68 A8 4C 74 10 A9 00 0A
0C11:AD 15 D0 09 02 8D 15 D0 31 0E49:8D 00 D0 A9 A0 8D 04 D0 F4 1071:9D DE 0F B9 F8 07 C9 C4 D1
0C19:60 00 AD 00 DC 29 10 C9 8C 0E51:A9 C8 8D 01 D0 8D 05 D0 CD 1079:F0 08 A9 C4 99 F8 07 4C A0
0C21:00 D0 26 AD 4B 0C C9 00 2B 0E59:60 A2 00 88 C0 FF F0 17 D5 1081:88 10 A9 C0 99 F8 07 FE E8
0C29:D0 1F AD 04 D0 8D 06 D0 01 0E61:FE 79 0E BD 79 0E C9 0A 9A 1089:7F 11 BD 7F 11 C9 29 D0 30
0C31:A9 C3 8D 07 D0 A9 28 A0 4F 0E69:D0 EF A9 00 9D 79 0E E8 F6 1091:11 A9 00 9D 7F 11 8A 48 1C
0C39:11 20 C6 12 A9 01 8D 4B 93 0E71:E0 06 D0 EC 4C 5A 0E 60 B0 1099:A0 80 20 C2 12 20 E5 12 49
0C41:0C AD 15 D0 09 08 8D 15 13 0E79:00 00 00 00 00 00 00 A2 38 10A1:68 A0 60 BD 81 11 D0 1E 98
0C49:D0 60 00 AD 1A 0C C9 01 52 0E81:00 88 C0 FF F0 17 FE 9F 59 10A9:BD D6 0F 1D DA 0F F0 75 7C
0C51:D0 26 AD 03 D0 E9 03 8D 03 0E89:0E BD 9F 0E C9 0A 00 EF F8 10B1:A9 01 9D 81 11 8A 48 A0 96
0C59:03 D0 4A 4A 20 BE 12 AD E2 0E91:A9 00 9D 9F 0E E8 E0 06 0C 10B9:81 A9 02 20 A3 12 20 C6 B3
0C61:03 D0 C9 12 D0 12 A9 00 AB 0E99:D0 EC 4C 80 0E 60 00 00 00 10C1:12 68 A4 CF 10 A9 00 31
0C69:8D 1A 0C AD 15 D0 49 02 AB 0EA1:00 00 00 00 00 00 00 A6 F4 10C9:9D D6 0F 9D DA 0F BD FC B5
0C71:8D 15 D0 A0 10 20 C2 12 52 0EA9:00 BD 79 0E 18 69 30 99 A5 10D1:07 DD 85 11 D0 08 A9 C4 6D
0C79:60 AD 4B 0C C9 01 D0 26 71 0EB1:61 05 BD 9F 0E 18 69 30 45 10D9:9D FC 07 4C E5 10 BD 85 1E
0C81:AD 07 D0 E9 03 8D 07 D0 18 0EB9:99 79 06 CA C8 0E FF D0 09 10E1:11 9D FC 07 FE 81 11 BD DF
0C89:4A 4A 20 E1 12 AD 07 D0 A1 0EC1:E8 60 A9 00 A2 09 9D D6 EA 10E9:81 11 C9 0A D0 37 A9 00 9F
0C91:C9 12 D0 12 A9 00 8D 4B 02 0EC9:0F CA E0 FF D0 F8 AE 1E 22 10F1:9D 81 11 8A 48 A0 80 20 F1
0C99:0C AD 15 D0 49 08 8D 15 6D 0ED1:D0 8E D4 0F 8A 29 0F F0 8D 10F9:C2 12 20 E5 12 68 AA BD A7
0CA1:D0 A0 10 20 E5 12 60 AD 34 0ED9:31 8A 29 F0 F0 2C 8A 29 DB 1101:85 11 C9 C2 D0 0A FE 85 C1
0CA9:AD 0D C9 01 F0 12 20 72 A7 0EE1:05 F0 4B AD D4 0F 29 01 37 1109:11 BD 85 11 9D FC 07 60 34
0CB1:0B C9 1E B0 F0 20 72 B0 59 0EE9:F0 0B A2 00 8E D5 0F 20 9F 1111:DE 85 11 BD 85 11 9D FC AA
0CB9:8D 08 D0 A9 01 8D AD 0D F5 0EF1:0C 0F 8D DE 0F AD D4 0F 5F 1119:07 8A 18 2A AA A9 FA 9D 96
0CC1:AD AE 0D C9 01 F0 12 20 AA 0EF9:29 04 F0 32 A2 04 8E D5 05 1121:09 D0 8A 6A AA 60 AD 84 AA
0CC9:72 0B C9 96 B0 0B 20 72 E4 0F01:0F 20 0C 0F 8D DF 0F 4C 77 1129:11 D0 1A AD D9 0F 0D DD 29
0CD1:0B 8D 0A D0 A9 01 8D AE 3C 0F09:2F 0F 60 A9 19 8D D2 0F DC 1131:0F F0 4A A9 01 8D 84 11 53
0CD9:0D AD AF 0D C9 01 F0 12 F0 0F11:A0 08 20 93 0F C9 01 F0 51 1139:A0 81 A9 02 20 A3 12 20 35
0CE1:20 72 0B C9 F5 90 0B 20 CC 0F19:F1 AE D5 0F A0 0A 20 93 88 1141:C6 12 4C 4E 11 A9 00 8D 76
0CE9:72 0B 8D 0C D0 A9 01 8D 2D 0F21:0F C9 01 F0 E5 AE D5 0F 0D 1149:D9 0F 8D DD 0F AD FF 07 E1
0CF1:AF 0D AD AC D0 C9 00 D0 06 0F29:A0 0C 20 93 0F 60 A9 0D 32 1151:C9 C5 D0 08 A9 C4 8D FF DF
0CF9:14 20 72 0B C9 32 D0 0D E8 0F31:8D D2 0F AD D4 0F 29 02 BE 1159:07 4C 62 11 A9 C5 8D FF EE
0D01:8D 0F D0 A2 FF 8E 0E D0 11 0F39:F0 28 A2 02 A0 8D 20 93 47 1161:07 EE 84 11 AD 84 11 C9 CF
0D09:A9 01 8D AC 0D AD AC 0D 3A 0F41:0F 8D D6 0F A2 02 A0 0A 7E 1169:29 D0 12 A9 00 8D 84 11 81
0D11:C9 00 D0 14 20 72 B0 C9 16 0F49:20 93 0F 8D D7 0F A2 02 59 1171:A0 80 20 C2 12 20 E5 12 23
0D19:32 D0 D0 AD 19 8E 0E D0 3C 0F51:A0 0C 20 93 0F 8D D8 0F 6F 1179:A9 C5 8D FF 07 60 00 00 4D
0D21:8D 0F D0 A9 02 8D AC 0D 27 0F59:A2 02 A0 0E 20 93 0F 8D 39 1181:00 00 00 00 C2 C2 C2 A2 EC
0D29:AD AD 0D C9 01 D0 13 CA E1 0F61:D9 0F AD D4 0F 29 08 F0 51 1189:E6 20 D2 11 BD CF 06 9D 69
0D31:0D 08 A9 17 8D 09 D0 8D 24 0F69:A1 A2 06 A0 08 20 93 0F C2 1191:F7 06 CA E0 00 D0 F2 A2 64
0D39:0D 08 A9 17 8D 09 D0 8D 24 0F71:8D DA 0F A2 06 A0 0A 20 FF 1199:E6 20 D2 11 BD DF 05 9D B7
0D41:AD 0D AD AE 0D C9 01 D0 78 0F79:93 0F 8D DB 0F A2 06 A0 44 11A1:07 06 CA D0 F4 A2 E6 20 4F
0D49:13 AC 0B D0 C8 8C 0B D0 E5 0F81:0C 20 93 0F 8D DC 0F A2 B1 11A9:D2 11 BD EF 04 9D 17 05 F9
0D51:0C FE D0 08 A9 17 8D 0B F5 0F89:06 A0 0E 20 93 0F 8D DD 68 11B1:CA D0 F4 A2 E6 20 D2 11 A4
0D59:D0 8D AE 0D AD AF 0D C9 F5 0F91:0F 60 A9 00 8D D3 0F 4C AA 11B9:BD FF 03 9D 27 04 CA D0 A4
0D61:01 D0 13 AC 0D D0 C8 8C 27 11C1:F4 A2 BE 20 D2 11 BD 0F 46

PROGRAMS

```

11C9:03 9D 37 03 CA E0 28 D0 E6
11D1:F2 8A C9 28 90 05 E9 28 60
11D9:4C D3 11 C9 00 D0 04 8A AB
11E1:E9 08 AA 60 A0 00 20 72 0E
11E9:0B C9 38 B0 F9 E9 18 AA 68
11F1:A9 2E 9D 00 04 C8 C0 03 EF
11F9:D0 EC 60 A2 00 A9 20 9D 7A
1201:00 04 E8 E0 20 D0 F6 60 E3
1209:A9 00 8D 2E 12 20 FC 11 B2
1211:20 E5 11 20 88 11 20 B1 5D
1219:0D 20 CB 0D EE 2E 12 AD 18
1221:2E 12 C9 1A D0 E7 20 FC 1F
1229:11 20 E5 11 60 00 A9 0F 11
1231:8D 18 D4 A9 4F 8D 13 D4 03
1239:A9 10 8D 14 D4 A9 11 8D 26
1241:12 D4 A9 FF 8D 0E D4 A9 D0
1249:59 8D A2 12 A2 F8 20 9D C9
1251:0B EE A2 12 AD A2 12 8D D5
1259:0F D4 C9 66 D0 EE A2 0A 6B
1261:20 9D 0B A9 65 8D A2 12 B1
1269:A2 F8 20 9D 0B EE A2 12 66
1271:AD A2 12 8D 0F D4 C9 80 10
1279:D0 EE A2 32 20 9D 0B A9 70
1281:81 8D A2 12 A2 F8 20 9D 16
1289:0B CE A2 12 AD A2 12 8D 06
1291:0F D4 C9 73 D0 EE A2 0F 79
1299:20 9D 0B A9 10 8D 12 D4 E0
12A1:60 00 A2 0F 8E 18 D4 A2 5C
12A9:4F 8E 05 D4 A2 10 8E 06 7F
12B1:D4 8C 04 D4 A2 FF 8E 00 63
12B9:D4 8D 01 D4 60 8D 01 D4 29
12C1:60 8C 04 D4 60 A2 0F 8E 41
12C9:18 D4 A2 4F 8E 0C D4 A2 69
12D1:10 8E 0D D4 8C 0B D4 A2 6D
12D9:FF 8E 07 D4 8D 0B D4 60 66
12E1:8D 08 D4 60 8C 0B D4 60 0A
12E9:A9 03 8D AE 13 8D AF 13 81
12F1:A9 C2 8D 85 11 8D 86 11 82
12F9:8D 87 11 A9 00 8D 7F 11 C9
1301:8D 80 11 8D 81 11 8D 82 F6
1309:11 8D 83 11 8D 84 11 8D CA
1311:1A 0C 8D 4B 0C 8D C7 13 E6
1319:A2 00 9D 79 0E 9D 9F 0E 10
1321:E8 E0 07 D0 F5 A2 00 9D B9
1329:AC 0D E8 E0 05 D0 F8 A2 14
1331:00 9D D2 0F E8 E0 0E D0 C1
1339:F8 60 AD DE 0F F0 34 CE 0B
1341:AE 13 AD AE 13 18 69 30 20
1349:8D DC 05 AD AE 13 C9 00 3E
1351:D0 21 A9 02 8D 21 D0 A9 B9
1359:C4 8D F8 07 A2 E6 20 9D 63
1361:0B AD 15 D0 49 01 8D 15 A6
1369:D0 A9 C0 8D F8 07 A9 00 8A
1371:8D 21 D0 AD DF 0F F0 34 EC
1379:CE AF 13 AD AF 13 18 69 93
1381:30 8D F4 06 AD AF 13 C9 3E
1389:00 D0 21 A9 02 8D 21 D0 FB
1391:A9 C4 8D FA 07 A2 E6 20 CF
1399:9D 0B AD 15 D0 49 04 8D 99
13A1:15 D0 A9 C0 8D FA 07 A9 D7
13A9:00 8D 21 D0 60 03 03 A5 1F
13B1:A1 C9 0F 90 10 A9 00 85 B2
13B9:A1 EE C7 13 AD C7 13 18 61
13C1:69 30 8D C7 04 60 00 20 98
13C9:09 12 A2 00 BD 19 14 9D 65
13D1:6E 05 E8 E0 10 D0 F5 A2 ED
13D9:00 BD 29 14 9D BB 05 E8 A4
13E1:E0 19 D0 F5 AD 01 DC 29 8C
13E9:0F C9 0B F0 07 C9 07 F0 D8
13F1:0E 4C E5 13 AD 15 D0 09 8C

```

```

13F9:01 8D 15 D0 4C 08 14 AD 0C
1401:15 D0 09 05 8D 15 D0 20 DB
1409:09 12 A2 00 BD 42 14 9D 4B
1411:6B 05 E8 E0 17 D0 F5 60 A3
1419:0D 0F 16 05 20 0A 0F 19 FE
1421:13 14 09 03 0B 20 23 31 79
1429:0C 05 06 14 20 06 0F 12 E3
1431:20 31 20 0F 12 20 12 09 E8
1439:07 08 14 20 06 0F 12 20 1C
1441:32 17 05 0C 03 0F 0D 05 1D
1449:20 01 02 0F 01 12 04 2C 77
1451:20 03 01 10 14 01 09 0E 30
1459:AD 15 D0 29 05 8D 15 D0 A3
1461:20 09 12 A2 00 BD BD 14 CE
1469:9D 6D 05 E8 E0 12 D0 F5 D1
1471:A2 00 BD CF 14 9D BE 05 39
1479:E8 E0 10 D0 F5 20 2F 12 FD
1481:20 2F 12 20 2F 12 20 09 D4
1489:12 A2 00 BD DF 14 9D 6B 35
1491:05 E8 E0 15 D0 F5 20 90 13
1499:0B A0 81 A9 03 20 A3 12 2C
14A1:A9 02 20 C6 12 A9 00 8D 54
14A9:F4 14 A2 0A 20 9D 0B EE C2
14B1:F4 14 AD F4 14 C9 1E D0 33
14B9:F3 4C 19 08 03 0F 0E 07 0A
14C1:12 01 14 15 0C 01 14 09 9C
14C9:0F 0E 13 21 21 21 0D 09 22
14D1:13 13 09 0F 0E 20 03 0F 60
14D9:0D 10 0C 05 14 05 14 08 43
14E1:01 0E 0B 20 19 0F 15 20 C0
14E9:06 0F 12 20 10 0C 01 19 E8
14F1:09 0E 07 00 FF 00 FF 00 03
14F9:FF 00 FF 00 FF 00 FF 00 42
1501:00 FF 00 FF 00 FF 00 FF 2B
1509:00 FF 00 FF 00 02 00 FF 3B
1511:00 FF 00 FF 00 FF 00 FF 3B
1519:00 FF 00 FF 00 FF 00 FF 43
1521:00 FF 00 FF 00 FF 00 FF 4B
1529:00 FF 00 FF 00 FF 00 FF 53
1531:00 FF 00 FF 00 FF 00 FF 5B
1539:00 FF 00 FF 00 FF 00 FF 63
1541:00 FF 00 FF 00 FF 00 FF 6B
1549:00 FF 00 FF 00 FF 00 FF 73
1551:00 FF 00 FF 00 FF 00 FF 7B
1559:00 FF 00 FF 00 FF 00 FF 83
1561:00 FF 00 FF 00 FF 00 FF 8B
1569:00 FF 00 FF 00 FF 00 FF 93
1571:00 FF 00 FF 00 FF 00 FF 9B
1579:00 FF 00 FF 00 FF 00 DD 81
1581:FF 00 FF 00 FF 00 FF 00 AB
1589:FF 00 FF 00 FF 00 FF 00 B3
1591:FF 00 FF 00 FF 00 FF 00 BB
1599:FF 00 FF 00 FF 00 FF 00 C3
15A1:FF 00 FF 00 FF 00 FF 00 CB
15A9:FF 00 FF 00 FF 00 FF 00 D3
15B1:FF 00 FF 00 FF 00 FF 00 DB
15B9:FF 00 FF 00 FF 00 FF 00 E3
15C1:FF 00 FF 00 FF 00 FF 00 EB
15C9:FF 00 FF 00 FF 00 FF 00 F3
15D1:FF 00 FF 00 FF 00 FF 00 FB
15D9:FF 00 FF 00 FF 00 FF 00 04
15E1:FF 00 FF 00 FF 00 FF 00 0C
15E9:FF 00 FF 00 FF 00 FF 00 14
15F1:FF 00 FF 00 FF 00 FF 00 1C
15F9:FF 00 FF 00 FF 00 FF 22 46
1601:00 FF 00 FF 00 FF 00 FF 2D
1609:00 FF 00 FF 00 FF 00 FF 35
1611:00 FF 00 FF 00 FF 00 FF 3D
1619:00 FF 00 FF 00 FF 00 FF 45
1621:00 FF 00 FF 00 FF 00 FF 4D

```

```

1629:00 FF 00 FF 00 FF 00 FF 55
1631:00 FF 00 00 00 00 00 00 5D

```

Bob Yu is working on a sequel to *Space Trek*. He lives in Lawrenceville, New Jersey.

PUSH BUTTON 64

By Matthew D. Boardman

Graphic environments such as GEOS are popular with users because they make ordinary computer tasks simple and fun to do. A menu-driven program is easy to learn, since there are no commands or complex keystrokes to remember. The trouble, however, is that the easier it is for the person to use the program, the more difficult it is for the programmer to write. With GEOS, for example, programmers have to use machine language and must acquaint themselves with the complex algorithms built into the GEOS system.

Push Button 64 lets any BASIC programmer create complex menu-driven applications for the 64. It uses machine language routines for speed, but you don't need to know any machine language to use the program. With Push Button 64, the most complex commands can be accessed with a simple arrow on the screen controlled with a joystick.

Typing It In

Push Button 64 consists of two parts—the actual program and a demonstration. The first is written in machine language. It must be entered using MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts you for the starting and ending addresses, respond with the following values.

Starting address: C000

Ending address: C267

Be sure to save a copy of this program before exiting MLX. Use the filename *Button64.ml* so that the second program can load it properly. The second program is a BASIC demonstration that shows how to incorporate the routines into your programs. To help you avoid typing errors, it should be entered with The Automatic Proofreader. Again, see "Typing Aids," and remember to save a copy of the program.

The Pointer

To see the demonstration, plug a joystick into port 2. Load the BASIC program and type *RUN*. The machine language code will be read from the disk and then an arrow will appear on-screen. Moving the joystick up, down, left, or right will make the arrow on-screen move accordingly. Pressing the fire button selects something on-screen. A clicking noise will confirm that the button was pressed.

The second line on the screen consists of four menus. To make the program shorter to type in, only the first two menus are functional. Maneuver the arrow onto the File menu and click the button. A sample menu pulls down.

Pointing and clicking the button on one of these menu items activates an associated routine. Click anywhere else and the menu closes. Click on the Load menu item. A box appears in the center of your screen indicating the item you selected. This box is called a dialog box, since it confirms choices or gets information from the user. For demonstration purposes, the selections activate dialog boxes rather than perform actual tasks. Point and click on the Continue box to go on.

The three buttons on the right of the screen activate dialog boxes that indicate which button you pressed. On the bottom of the screen is a slider. This is a graphical way for the user to input information, in this example a number from 0 to 26. Point and click on the left or right triangle on either side of the slider to decrease or increase the number respectively. The red slider moves to the left or right, and the number on the right of the slider changes accordingly. If you point and click on an empty part of the slider, the red indicator moves to that position, and the number changes. To leave the program, click on the Files menu and select Quit.

Your Own Menus

The machine language program contains several routines that are accessed through the following SYS calls and memory locations.

Activate Arrow (SYS 49152)

This command causes an arrow to appear on the screen. You can control it

by moving the joystick.

Deactivate Arrow (SYS 49633)

This removes the arrow from the screen and deactivates the analysis program, but the following two commands can still be accessed.

Save Screen (SYS 49653)

This saves the characters and colors on the screen to two special buffers. It is included in order to make the pop-up menus easier to manipulate.

Load Screen (SYS 49709)

This retrieves the characters and colors from the buffers and restores the screen as it was when the screen was saved. The technique for using these two commands is explained below.

Flag (location 49572)

This is a variable which allows your BASIC program to tell the machine language routine whether or not it is accepting button presses. If the location contains a 1, then the computer will ignore all button presses. If you poke a 0 into the location, this tells the machine language routine to process button presses normally.

Xchar (49571)

This is the x coordinate of the screen character in which the arrow was present when the button was last pressed, a number from 0 to 39.

Ychar (49570)

This is the corresponding y coordinate of the screen character, from 0 to 24. These two locations help to determine which object the user is pointing to.

Xdot (49568)

This is the actual x coordinate of the arrow in pixels. This is useful if you need more accuracy than just a character coordinate or if you are working in high-resolution mode.

High (49569)

This is the most significant byte of the sprite's x coordinate; see the 64's user's manual for a more detailed explanation of sprite coordinates. The location either contains a 0 or a 1, regardless of the positions of all other sprites. It makes Xdot a 16-bit number.

Ydot (49567)

This is the corresponding y coordinate of the sprite.

How It Works

When the machine language routine is activated (SYS 49152), it puts two sprites on the screen to create the arrow. The first sprite is a white arrow, and the second is a black outline directly underneath. These two colors allow the sprite to show up on all background colors. The actual coordinates used when the user clicks the button are those of the tip of the white part of the arrow.

The activation routine also sets up a machine language interrupt that calls the routine to move the arrow sprite with the joystick. The deactivation routine turns off this interrupt and the sprite. You can turn the arrow on and off as often as you need with successive calls of the activation and deactivation routines.

When the routine detects a press of the button, it stores the current sprite coordinates in Xdot, Ydot, and High. It then converts these coordinates into character coordinates and stores them in Xchar and Ychar. A 1 is then placed in Flag so that no more clicks will be processed until the BASIC program has determined what to do. The BASIC program must poke a 0 into Flag in order for the machine language routine to analyze more coordinates.

The Demo Program

You don't have to know all of this to use the routines, however. The BASIC demonstration shows how to use them in terms of menu manipulation. The program has numerous comments in the form of REM statements that show the operation of the program, which you can take note of as you type it in. The program's plan of attack is as follows.

1. Load in the machine language routines and run the activation sequence (SYS 49152).
2. Draw the screen, showing all buttons, menus, and sliders. Save the screen to the buffers (SYS 49653).
3. Wait until Flag contains a 1.
4. Determine if the Xchar and Ychar coordinates show a point that the program recognizes and jump to the ap-

PROGRAMS

appropriate subroutine if so. If not, type *POKE FLAG,0* and repeat step 4.
5. When the routine has finished, load the old screen back in from the buffers (SYS 49709) and continue with step 3.

Examine the routines in the BASIC demo to get ideas for your own programs, or modify this one to suit your needs. The machine language routines will not interfere with BASIC programs.

The demonstration program contains other routines that may be useful. One is for drawing dialog boxes. You can include those routines in your own programs to make your programming easier. For example, step 3 is actually a subroutine (lines 1570-1630) that puts Xchar into variable X and Ychar into variable Y. The dialog box is drawn by another routine (lines 1500-1550).

Since the routine that moves the arrow works in the background, you can type in BASIC programs while the arrow is onscreen. If you position the arrow and then peek the Xchar and Ychar coordinates, you can position the buttons onscreen more easily.

You are not limited to BASIC, however. Since the machine language routines are called by the SYS command, machine language programmers can call the routines with a JSR command. Feel free to experiment.

PUSH BUTTON 64

```
C000:78 AD 14 03 8D C8 C0 AD 9A
C008:15 03 8D C9 C0 A9 CA 8D F2
C010:14 03 A9 C0 8D 15 03 A9 0E
C018:C0 8D F8 07 A9 C1 8D F9 56
C020:07 A9 03 8D 15 D0 A9 00 08
C028:8D A4 C1 AD 10 D0 29 7C 3F
C030:8D 10 D0 A9 01 8D 27 D0 8E
C038:A9 00 8D 28 D0 A9 65 8D 4B
C040:00 D0 8D 01 D0 A9 64 8D 38
C048:02 D0 8D 03 D0 A2 00 A9 9B
C050:00 9D 00 3D E8 E0 81 D0 DA
C058:F8 A2 00 BD 86 C0 9D 00 4D
C060:30 E8 E0 1D D0 F5 A2 00 C5
C068:BD A3 C0 9D 40 30 E8 E0 19
C070:23 D0 F5 A9 00 8D A0 C1 4A
C078:8D 9F C1 8D A1 C1 8D A3 8C
C080:C1 8D A2 C1 58 60 80 00 FB
C088:00 60 00 00 78 00 00 3E 24
C090:00 00 3C 00 00 1E 00 00 12
C098:17 00 00 03 80 00 01 C0 9C
C0A0:00 00 80 C0 00 00 B0 00 9F
C0A8:00 4C 00 00 43 00 00 20 77
C0B0:80 00 21 00 00 10 80 00 D7
C0B8:14 40 00 0A 20 00 01 10 08
C0C0:00 00 A0 00 00 40 00 00 57
C0C8:00 00 EA AD 00 DC 29 01 49
C0D0:C9 01 F0 10 AD 01 D0 C9 73
```

```
C0D8:33 B0 03 4C E4 C0 CE 01 0E
C0E0:D0 CE 03 D0 AD 00 DC 29 3C
C0E8:02 C9 02 F0 10 AD 01 D0 37
C0F0:C9 F9 90 03 4C FD C0 EE E2
C0F8:01 D0 EE 03 D0 AD 00 DC 57
C100:29 04 C9 04 F0 33 AD 10 52
C108:D0 29 02 C9 02 F0 0A AD B0
C110:02 D0 C9 18 B0 03 4C 39 E6
C118:C1 AD 00 D0 D0 08 AD 10 07
C120:D0 29 7E 8D 10 D0 CE 00 60
C128:D0 AD 02 D0 D0 08 AD 10 DE
C130:D0 29 7D 8D 10 D0 CE 02 52
C138:D0 AD 00 DC 29 08 C9 08 62
C140:F0 2D AD 10 D0 29 01 C9 35
C148:01 D0 0A AD 00 D0 C9 57 CA
C150:90 03 4C 6F C1 EE 00 D0 F7
C158:D0 08 AD 10 D0 09 01 8D 37
C160:10 D0 EE 02 D0 08 AD A5
C168:10 D0 09 02 8D 10 D0 AD 65
C170:00 DC 29 10 C9 10 F0 03 C4
C178:4C 7E C1 6C 18 C0 AD A4 0A
C180:C1 C9 00 D0 F6 A9 01 8D 52
C188:A4 C1 AD 01 D0 8D 9F C1 52
C190:AD 00 D0 8D A0 C1 AD 10 55
C198:D0 8D A1 C1 4C A5 C1 00 B4
C1A0:00 00 00 00 00 AD 9F C1 DB
C1A8:E9 32 4A 4A 8D A2 C1 2B
C1B0:AD A1 C1 29 01 C9 01 D0 40
C1B8:15 A9 01 8D A1 C1 AD A0 3A
C1C0:C1 69 03 4A 4A 69 1C EE
C1C8:8D A3 C1 4C 7B C1 A9 00 2F
C1D0:8D A1 C1 AD A0 C1 E9 17 8D
C1D8:4A 4A 4A 8D A3 C1 4C 7B 6E
C1E0:C1 78 AD C8 C0 8D 14 03 0D
C1E8:AD C9 C0 8D 15 C3 58 A9 B5
C1F0:FC 8D 15 D0 60 A2 00 BD 51
C1F8:00 04 9D 65 C2 BD 00 D8 6D
C200:9D 65 C6 BD 00 05 9D 65 17
C208:C3 BD 00 D9 9D 65 C7 BD 4C
C210:00 06 9D 65 C4 BD 00 DA 19
C218:9D 65 C8 BD 00 07 9D 65 77
C220:C5 BD 00 DB 9D 65 C9 E8 B4
C228:E0 00 D0 CB 60 A2 00 BD 40
C230:65 C2 9D 00 04 BD 65 C6 75
C238:9D 00 D8 BD 65 C3 9D 00 F8
C240:05 BD 65 C7 9D 00 D9 BD 3F
C248:65 C4 9D 00 06 BD 65 C8 20
C250:9D 00 DA BD 65 C5 9D 00 59
C258:9D BD 65 C9 9D 00 DB E8 A7
C260:E0 00 D0 CB 60 A3 00 00 BE
```

BUTTON DEMO

```
PK 5 REM COPYRIGHT 1993 - COMP
UTE PUBLICATIONS INTL LTD
- ALL RIGHTS RESERVED
DR 10 REM LOAD AND RUN PROGRAM
AB 20 IF X=0 THEN X=1:LOAD"BUT
TON64.ML",8,1
MM 30 SYS 49152:POKE 53280,0:P
OKE 53281,15
HF 40 REM SETUP SCREEN AND MEN
US
HJ 50 PRINTCHR$(14)"{CLR}{RVS}
{BLU}MENU{SHIFT-SPACE}TE
MPLATE{27 SPACES}";
CG 60 PRINT"{WHT}{RVS}FILE
{3 SPACES}{M}LAYOUT {M}T
OOLS{2 SPACES}{M}OPTIONS
{9 SPACES}{OFF}";
```

```
CJ 70 PRINT"{DOWN}{5 SPACES}
{BLK}{DOWN}{LEFT}-
{DOWN}{3 LEFT}{WHT}CLICK
ON THESE TO TEST MENUS.
"
SS 80 PRINT"{2 DOWN}CLICK ON T
HESE":PRINT"TO TEST BUTT
ONS {BLK}***"
CF 90 PRINTTAB(21)"{2 UP}{CYN}
{A}*****{S}"
KJ 100 PRINTTAB(21)"{CYN}-
{BLK}{RVS}{@}{WHT}{OFF}
BUTTON #1{CYN}-"
EG 110 PRINTTAB(21)"{CYN}-
{BLK}{RVS}{@}{WHT}{OFF}
BUTTON #2{CYN}-"
DF 120 PRINTTAB(21)"{CYN}-
{BLK}{RVS}{@}{WHT}{OFF}
BUTTON #3{CYN}-"
SX 130 PRINTTAB(21)"{CYN}{Z}**
*****{X}"
CS 140 PRINT"{3 DOWN}
{2 SPACES}{CYN}{A}*****
*****{S}"
KD 150 PRINT"{2 SPACES}{CYN}-
{SPACE}{BLK}{RVS}<{OFF}
{WHT}*****
{RED}+{WHT}*****
{BLK}{RVS}>{OFF}{WHT}1
5{CYN}-"
MM 160 PRINT"{2 SPACES}{CYN}
{Z}*****
*****{X}{BLK}"
CP 170 PRINT"{DOWN}{4 RIGHT}
{DOWN}{LEFT}-{DOWN}
{LEFT}-{DOWN}{3 LEFT}
{WHT}CLICK ON THIS TO T
EST SLIDER."
DB 180 SL=15
HM 190 SYS 49653 : REM SAVE SC
REEN TO BUFFER
SP 200 GOSUB 1570 : REM GET A
{SPACE}POINT
AP 210 REM TEST FOR KNOWN POIN
TS
QE 220 IF Y>1 THEN 270
HH 230 IF X<8 THEN 320:REM FIL
ES
BB 240 IF X>7 AND X<16 THEN 84
0:REM LAYOUT
KJ 250 IF X>15 AND X<24 THEN 9
90:REM TOOLS
SR 260 IF X>23 THEN 1070:REM O
PTIONS
AM 270 IF X=22 AND Y=9 THEN 11
50:REM B1
PK 280 IF X=22 AND Y=10 THEN 1
230:REM B2
EG 290 IF X=22 AND Y=11 THEN 1
310:REM B3
KK 300 IF Y=17 THEN 1390 : REM
SLIDER
CJ 310 GOTO 190
AG 320 REM FILE MENU WAS CHOSE
N
MS 330 PRINT"{HOME}{2 DOWN}
```



```

{RIGHT}{WHT}{RVS}LOAD
{4 SPACES}{DOWN}
{8 LEFT}SAVE{4 SPACES}
{BLK}{WHT}{DOWN}
{9 LEFT}";
SH 340 PRINT"NEW{5 SPACES}
{BLK}{WHT}{DOWN}
{9 LEFT}DIR{5 SPACES}
{BLK}{WHT}{DOWN}
{9 LEFT}";
JE 350 PRINT"QUIT{4 SPACES}
{BLK}{WHT}{DOWN}
{9 LEFT}";
FA 360 PRINT"{BLK}{RIGHT}
{8 SPACES}{OFF}{WHT}"
DB 370 GOSUB 1570
FP 380 IF X<1 OR X>8 THEN 440
QF 390 IF Y=2 THEN 450 : REM L
OAD ROUTINE
BJ 400 IF Y=3 THEN 520 : REM S
AVE ROUTINE
EF 410 IF Y=4 THEN 590 : REM N
EW ROUTINE
CE 420 IF Y=5 THEN 660 : REM D
IR ROUTINE
MM 430 IF Y=6 THEN 730 : REM Q
UIT ROUTINE
KK 440 SYS 49709 : GOTO 190
DB 450 GOSUB 1500
JF 460 PRINT"{HOME}{7 DOWN}
{12 RIGHT}{RVS}{WHT}YOU
PRESSED THE"
QS 470 PRINT"{11 RIGHT}{RVS}LO
AD ROUTINE."
QK 480 PRINT"{2 DOWN}
{19 RIGHT}{BLK}{RVS} CO
NTINUE "
AK 490 GOSUB 1570
XO 500 IF Y<>11 OR X<19 OR X>2
8 THEN 490 XQ
MR 510 SYS 49709:GOTO 190
QF 520 GOSUB 1500
KB 530 PRINT"{HOME}{7 DOWN}
{12 RIGHT}{RVS}{WHT}YOU
PRESSED THE"
FE 540 PRINT"{11 RIGHT}{RVS}SA
VE ROUTINE."
QF 550 PRINT"{2 DOWN}
{19 RIGHT}{BLK}{RVS} CO
NTINUE "
BR 560 GOSUB 1570
AG 570 IF Y<>11 OR X<19 OR X>2
8 THEN 490
XA 580 SYS 49709:GOTO 190
JJ 590 GOSUB 1500
PR 600 PRINT"{HOME}{7 DOWN}
{12 RIGHT}{RVS}{WHT}YOU
PRESSED THE"
GR 610 PRINT"{11 RIGHT}{RVS}NE
W ROUTINE."
PB 620 PRINT"{2 DOWN}
{19 RIGHT}{BLK}{RVS} CO
NTINUE "
DB 630 GOSUB 1570
BC 640 IF Y<>11 OR X<19 OR X>2
8 THEN 490
SE 650 SYS 49709:GOTO 190
KQ 660 GOSUB 1500
XJ 670 PRINT"{HOME}{7 DOWN}
{12 RIGHT}{RVS}{WHT}YOU
PRESSED THE"
PG 680 PRINT"{11 RIGHT}{RVS}DI
R ROUTINE."
HS 690 PRINT"{2 DOWN}
{19 RIGHT}{BLK}{RVS} CO
NTINUE "
CF 700 GOSUB 1570
GS 710 IF Y<>11 OR X<19 OR X>2
8 THEN 490
BX 720 SYS 49709:GOTO 190
PA 730 GOSUB 1500
SF 740 PRINT"{HOME}{7 DOWN}
{11 RIGHT}{RVS}{WHT}ARE
YOU SURE YOU"
KA 750 PRINT"{11 RIGHT}{RVS}WA
NT TO QUIT THE"
PE 760 PRINT"{11 RIGHT}{RVS}PR
OGRAM?"
CX 770 PRINT"{DOWN}{11 RIGHT}
{BLK}{RVS} YES
{9 RIGHT} NO "
CP 780 GOSUB 1570
AS 790 IF Y<>11 THEN 780
PP 800 IF X>10 AND X<16 THEN 8
30
KD 810 IF X>24 AND X<29 THEN S
YS49709:GOTO 190
JM 820 GOTO 780
XK 830 SYS 49633:POKE 53280,14
:POKE 53281,6:PRINT"
{CLR}{7}"CHR$(142)::END
REM LAYOUT MENU
XF 850 PRINT"{HOME}{2 DOWN}
{9 RIGHT}{RVS}{WHT}LAYO
UT 1{DOWN}{8 LEFT}LAYO
UT 2{BLK}{WHT}{DOWN}
{9 LEFT}LAYOUT 3{BLK} "
;
CX 860 PRINT"{WHT}{DOWN}
{9 LEFT}LAYOUT 4{BLK}
{WHT}{DOWN}{9 LEFT}LAYO
UT 5{BLK}{WHT}{DOWN}
{9 LEFT}LAYOUT 6{BLK} "
;
JM 870 PRINT"{WHT}{DOWN}
{9 LEFT}LAYOUT 7{BLK}
{WHT}{DOWN}{9 LEFT}LAYO
UT 8{BLK}{DOWN}
{8 LEFT}{8 SPACES}"
MB 880 GOSUB 1570
JS 890 IF X<9 OR X>16 THEN 980
GH 900 IF Y<2 OR Y>9 THEN 980
JX 910 L=Y-1
KQ 920 GOSUB 1500
GG 930 PRINT"{HOME}{7 DOWN}
{11 RIGHT}{RVS}{WHT}LAY
OUT #"L
MQ 940 PRINT"{RVS}{11 RIGHT}WA
S SELECTED."
HX 950 PRINT"{2 DOWN}
{19 RIGHT}{BLK}{RVS} CO
NTINUE "
XE 960 GOSUB 1570
MM 970 IF Y<>11 OR X<19 OR X>2
8 THEN 960
AS 980 SYS 49709:GOTO 190
XR 990 REM TOOLS MENU
XD 1000 GOSUB 1500
MS 1010 PRINT"{HOME}{7 DOWN}
{11 RIGHT}{RVS}{WHT}TH
E TOOLS MENU"
PH 1020 PRINT"{RVS}{11 RIGHT}W
AS SELECTED."
CF 1030 PRINT"{2 DOWN}
{19 RIGHT}{BLK}{RVS} C
ONTINUE "
HP 1040 GOSUB 1570
XQ 1050 IF Y<>11 OR X<19 OR X>
28 THEN 960
CQ 1060 SYS 49709:GOTO 190
SG 1070 REM OPTIONS MENU
HK 1080 GOSUB 1500
MJ 1090 PRINT"{HOME}{7 DOWN}
{11 RIGHT}{RVS}{WHT}TH
E OPTIONS MENU"
EM 1100 PRINT"{RVS}{11 RIGHT}W
AS SELECTED."
GA 1110 PRINT"{2 DOWN}
{19 RIGHT}{BLK}{RVS} C
ONTINUE "
DS 1120 GOSUB 1570
QH 1130 IF Y<>11 OR X<19 OR X>
28 THEN 960
KH 1140 SYS 49709:GOTO 190
DB 1150 REM BUTTON #1 WAS PRES
SED
DQ 1160 GOSUB 1500
KD 1170 PRINT"{HOME}{7 DOWN}
{11 RIGHT}{RVS}{WHT}YO
U PRESSED"
CX 1180 PRINT"{RVS}{11 RIGHT}B
UTTON #1."
SK 1190 PRINT"{2 DOWN}
{19 RIGHT}{BLK}{RVS} C
ONTINUE "
QF 1200 GOSUB 1570
AD 1210 IF Y<>11 OR X<19 OR X>
28 THEN 960
FP 1220 SYS 49709:GOTO 190
QM 1230 REM BUTTON #2 WAS PRES
SED
QD 1240 GOSUB 1500
QJ 1250 PRINT"{HOME}{7 DOWN}
{11 RIGHT}{RVS}{WHT}YO
U PRESSED"
XJ 1260 PRINT"{RVS}{11 RIGHT}B
UTTON #2."
BF 1270 PRINT"{2 DOWN}
{19 RIGHT}{BLK}{RVS} C
ONTINUE "
EP 1280 GOSUB 1570
JQ 1290 IF Y<>11 OR X<19 OR X>
28 THEN 960
BS 1300 SYS 49709:GOTO 190
ME 1310 REM BUTTON #3 WAS PRES
SED
JG 1320 GOSUB 1500
AF 1330 PRINT"{HOME}{7 DOWN}
{11 RIGHT}{RVS}{WHT}YO
U PRESSED"
DC 1340 PRINT"{RVS}{11 RIGHT}B

```


PROGRAMS

```

UTTON #3."
FA 1350 PRINT "{2 DOWN}
      {19 RIGHT}{BLK}{RVS} C
      ONTINUE "
AS 1360 GOSUB 1570
RH 1370 IF Y<>11 OR X<19 OR X>
      28 THEN 960
JH 1380 SYS 49709:GOTO 190
QC 1390 REM SLIDER
FX 1400 GOSUB 1450
JA 1410 IF X=4 AND SL>0 THEN G
      OSUB 1460:SL=SL-1:GOSU
      B1470:GOTO 1480
EC 1420 IF X=32 AND SL<26 THEN
      GOSUB 1460:SL=SL+1:GO
      SUB1470:GOTO 1480
KQ 1430 IF X>4 AND X<32 THEN G
      OSUB 1460:SL=X-5:GOSUB1
      470:GOTO1480
QJ 1440 GOTO 190
MR 1450 PRINT "{HOME}{17 DOWN}
      {3 RIGHT}";:RETURN
DA 1460 GOSUB1450:FOR T=0 TO SL+
      1:PRINT "{RIGHT}";:NEXT
      :PRINT "{WHT}*";:RETURN
HF 1470 GOSUB1450:FOR T=0 TO SL+
      1:PRINT "{RIGHT}";:NEXT
      :PRINT "{RED}+";:RETURN
JQ 1480 GOSUB1450:PRINT "{DOWN}
      {10 LEFT}{WHT}";:IF SL
      >9 THEN PRINTSL "{LEFT}
      {CYN}";:GOTO 190
SX 1490 PRINT "SL"{LEFT}{CYN}
      -":GOTO 190
AB 1500 REM DRAW DIALOG BOX
BA 1510 SYS 49709 : REM LOAD S
      CREEN
GP 1520 PRINT "{HOME}{6 DOWN}
      {10 RIGHT}{RVS}{WHT}
      {20 SPACES}"
QE 1530 FOR T=1 TO 6:PRINT "
      {10 RIGHT}{RVS}
      {20 SPACES}{BLK} {WHT}
      ":NEXT
CM 1540 PRINT "{11 RIGHT}{RVS}
      {BLK}{20 SPACES}"
ED 1550 RETURN
CG 1560 REM -----
QP 1570 REM GET A SCREEN COORD
      FROM ML
KF 1580 POKE 49572,0
PP 1590 IF PEEK(49572)=0 THEN
      {SPACE}1590
SJ 1600 X=PEEK(49571):Y=PEEK(4
      9570)
RX 1610 POKE 54296,15:POKE 542
      96,0
ME 1620 IF PEEK(56320)<>127 TH
      EN 1620
JH 1630 RETURN

```

Matthew D. Boardman is an electrical engineering student at Technical University of Nova Scotia. He lives in Chester Basin, Nova Scotia, Canada.

EZ-LOADER

By Joe Votour

Finding files on disks can be quite a chore. Just ask anybody who has more than a couple of disks on hand. It's especially true if you're a programmer. Once you find the disk you're looking for, you'll then probably have to search through the directory about five times before you finally hit on the right file.

A menu program is especially helpful for finding your frequently used programs. This is where EZ-Loader comes in. EZ-Loader is a menu program for the 64 that will read a disk directory and let you select a file using the cursor keys and the Return key. It'll also do more.

Typing It In

EZ-Loader is written entirely in machine language. To enter it, use MLX, our machine language entry program. See "Typing Aids" elsewhere in this section. When MLX prompts, respond with the following.

Starting address: 0801

Ending address: 1380

Be sure to save a copy of the program before you exit MLX.

Drive Compatibility

EZ-Loader will work with any 1541, 1571, or 1581 drive. In fact, it'll work with any combination of drives (device numbers 8-99, drive number 0 only) that support Commodore's DOS commands U1 and B-P. A 1581 drive has two limitations, however. EZ-Loader supports partitions, but it locates only the first 255 files in the main directory or partition. Also, the disk ID will be read incorrectly since EZ-Loader checks track 18, sector 0, the track and sector used for a 1541/1571 ID code.

Using EZ-Loader

Although EZ-Loader is written in machine language, it loads and runs like a BASIC program. The title screen is displayed as the directory of the current drive is loaded. Note that the directory loaded is the one of the disk drive from which EZ-Loader was loaded.

On the main screen, a blue bar indicates the current file to be selected. To move the bar, use the cursor keys to

move up and down the directory listing. To load the highlighted file, press the Return key.

The function keys are defined for special purposes. Press f1 to see a directory in the usual format. It's like using the LOAD "\$",8 command, with the program type and block size listed. Press any key and EZ-Loader will return to its title screen and reload that directory.

Press f3 to change disks in the current drive. You will then be returned to the title screen, and EZ-Loader will read the directory as usual.

Press f5 to enter a DOS command to the current drive. Any standard DOS command can be issued. This will allow 1581 users to change partitions by simply typing /O:PARTITION NAME. Also, EZ-Loader offers a new DOS command, #aa, where aa is a two-digit drive number such as 09 or 10. The number must be a two-digit number; otherwise, EZ-Loader will lock up while trying to read the number.

Press f8 to boot the first file on any drive. You will be asked which device to boot from (8-11 only). To change the device number, use the cursor keys. Then the program will load and run from the device you selected.

Additional Notes

EZ-Loader will convert to question marks any control characters that appear in a filename. These include any non-ASCII values, color codes, and so on. For example, if you have a Koala Paint file called A, it will appear in the directory listing as ?PIC A. If you have files that have the same filename except for a control character, EZ-Loader may get confused. Not too many programs use filenames such as these, however.

EZ-Loader can load only BASIC programs or machine language programs that start with a SYS statement. This is because the program is loaded using the ,n extension, where n is the device number of the drive. A RUN command is executed from the keyboard buffer.

EZ-LOADER

```

0801:0B 08 90 06 9E 32 30 34 5D
0809:39 00 A0 00 78 E6 01 B9 E4
0811:C9 12 99 40 03 C8 D0 F7 96
0819:4C 40 03 98 FB 91 FD 93 FE
0821:82 E6 FE 17 02 D8 D0 EF 82

```


0829:A9 37 85 01 58 8E 16 76 3C
0831:00 16 10 20 B9 42 24 BD A7
0839:00 17 14 21 49 FF 9D 00 29
0841:25 E8 D0 E7 20 16 D9 15 D8
0849:66 09 20 4A A9 DA 0A 88 CC
0851:0A BC C2 62 20 F5 E1 E5 96
0859:22 0C 20 E4 FF C9 85 59 5B
0861:9F 0C C9 86 03 6A 21 B0 9A
0869:87 72 35 0D C9 8C D0 83 F6
0871:DA 17 76 E0 11 1F C9 91 BB
0879:F0 37 C9 0D D0 D5 4C F7 48
0881:36 F6 36 63 CD 8F 90 06 3B
0889:8C 64 70 C3 CE F7 DB D0 22
0891:06 0C CB 4C 86 08 92 62 C1
0899:07 B0 03 29 49 38 E9 E0 2C
08A1:42 20 39 0C E9 B6 07 3E 39
08A9:4C 83 08 48 DF 8D 3F 34 2E
08B1:56 61 8D 21 41 06 E4 36 2B
08B9:10 19 8D 18 D0 A9 B4 61 43
08C1:0D 22 06 85 FB A9 A2 74 3A
08C9:FC FC A9 A9 20 91 FB 74 1B
08D1:F9 E6 FC A5 FC C9 39 EE 03
08D9:EC 60 85 02 84 29 4D 81 2E
08E1:B1 02 C0 A7 0B 20 D2 FF 5C
08E9:E6 02 D0 F1 E6 03 D0 74 80
08F1:E7 02 A6 BA 27 89 BA FF CB
08F9:07 F1 FE A9 06 A2 1F A0 1E
0901:0F 20 BD B2 15 C0 3F 09 B8
0909:C8 F4 43 9D ED F3 47 10 DC
0911:F5 AC CC 09 A5 FE 43 2D 50
0919:D0 22 EE 4E 91 C9 FF 0B 9D
0921:5C 29 0A 08 9A CA 64 C4 FA
0929:C0 91 FC C8 98 DD B9 86 62
0931:6C 4C 8F 09 AD 2D B5 18 B4
0939:69 01 8D 1A 0F A9 38 EB 0F
0941:C3 DC CC 39 5D 6E A2 02 85
0949:23 1A 96 1A EC D0 F4 20 9C
0951:CF 51 6A FD 09 B0 0E 33 27
0959:9D E8 C9 22 F0 18 20 14 0C
0961:0A 8A 96 EA E6 FE A2 01 16
0969:20 C6 FF 00 18 AA A5 90 8A
0971:D0 02 8A 60 38 60 98 48 80
0979:20 F7 09 68 6A FE BE 9D AB
0981:00 28 60 A0 A6 DD 2F 09 C7
0989:9A 67 27 99 A7 02 9A 4C 08
0991:3F 4C 20 0A 4B C1 FD AE 07
0999:C0 DA 86 FC 18 E7 20 06 0A
09A1:FC 26 FD A5 FD 69 29 85 43
09A9:FD 8E EB 85 90 14 6A FF D1
09B1:B0 5F 8A F2 3B A9 23 04 3F
09B9:A2 B0 32 6C F7 EA 9C 3A 35
09C1:6F AE C3 B9 78 2B FA 00 B1
09C9:F0 06 20 DD ED C8 D0 F3 DF
09D1:7E 6B 86 09 8D 62 D0 C7 5D
09D9:ED 4A 21 20 13 EE 99 A6 C9
09E1:30 7B D8 CF F5 20 EF 89 9C
09E9:08 C9 E2 A1 19 A5 EC 0C E2
09F1:ED A9 EF 20 B9 ED 20 FE 2A
09F9:ED 60 D7 EE 50 20 86 6C 81
0A01:A0 11 3A 6F A6 BA 16 A6 DA
0A09:53 A4 D5 20 65 0B 2A CF 28
0A11:34 03 C0 B3 73 96 6F 18 40
0A19:ED 67 08 B4 99 D9 CF CA E8
0A21:50 67 0F 70 F5 D9 27 0F 94
0A29:F0 10 75 F5 40 AF 9E E5 AB
0A31:70 05 D0 E9 4C 40 BA 22 72
0A39:20 4C 30 D3 A5 F4 53 AE 0A
0A41:1A 0F E0 00 D0 05 65 B9 61
0A49:4C 55 0B 9F 4F 83 A9 F2 03
0A51:A0 12 A1 C9 13 80 5D CD 2E

0A59:F2 EE 0D DC EE 74 72 1B 5B
0A61:8D 11 12 E9 6F 19 A9 82 17
0A69:63 E2 0B 74 E2 60 2E 19 9E
0A71:94 93 63 A9 C8 8D 16 94 F8
0A79:06 F6 19 A0 5D 88 D0 8C B6
0A81:46 0E 60 A2 D7 E8 85 E3 C3
0A89:00 E4 84 C9 93 28 27 C5 55
0A91:50 D8 BD 91 69 9D 78 D8 60
0A99:F3 28 D0 E3 6D 06 0B AD 51
0AA1:1E 59 8D 12 D0 4C 31 EA F2
0AA9:EE CE 2E 60 C9 02 D0 1B C7
0AB1:D2 90 1C 7C 35 48 A2 00 AE
0AB9:BD 83 0F 26 36 E8 E0 30 19
0AC1:D0 F5 68 CA 9D 82 61 1B 4A
0AC9:30 36 DC 01 8D C5 B1 02 18
0AD1:96 8D F2 A9 A2 09 A0 1A 22
0AD9:18 20 F0 59 80 20 8D 82 D7
0AE1:53 83 05 8D 84 05 AD 1E AB
0AE9:0F AE 1D 0F EC 4E 60 AD D4
0AF1:1B 26 27 07 B0 46 A0 80 A5
0AF9:ED 92 5E A9 CA 8D 26 0F F7
0B01:50 4D 29 0A 19 27 82 A9 6C
0B09:0B 85 D6 2E 25 A9 0C 85 31
0B11:D3 2B 2A B1 FC 32 96 4F 69
0B19:C0 10 D0 F6 4C 5D 0C A5 B2
0B21:FC 18 69 10 85 FC A5 FD 53
0B29:69 F4 E5 FD 94 EE B5 A3
0B31:AD 25 0F C9 08 D0 D1 60 6D
0B39:78 B8 05 8D 1A 1C 59 31 58
0B41:8D 14 03 A9 EA 8D 15 03 D8
0B49:58 20 A3 FD 20 18 E5 E7 FC
0B51:1B 8D 20 D0 8D 21 D0 A9 A5
0B59:19 8D 18 D0 60 B9 17 28 AF
0B61:20 ED B2 90 A2 08 8C 95 46
0B69:BA 79 02 A2 9B E4 E4 BD 9D
0B71:C8 C0 FF 4A 6D D3 B4 11 BD
0B79:85 FB 24 86 05 FB F0 35 6D
0B81:A9 0D 81 25 AD 63 DB 01 E5
0B89:4C B1 36 14 03 F0 1F A2 F6
0B91:24 2A C6 76 87 AA 56 20 38
0B99:CD BD A9 20 A8 07 00 F0 8F
0BA1:C5 82 72 4C FF C1 01 20 77
0BA9:C3 D6 F4 CC F8 FA 79 1F 88
0BB1:D2 F0 FB 70 94 9D 3D 2A B3
0BB9:5B C1 F1 4C F0 A0 14 29 4A
0BC1:A2 93 19 CF BE 28 F0 06 AC
0BC9:9D C9 E8 D0 F3 8E A4 6B D9
0BD1:AD 0F C9 23 F0 7A C9 00 F2
0BD9:8B ED 4C 07 0E 9B 85 85 9A
0BE1:90 A3 58 70 08 62 DD ED AE
0BE9:48 10 03 86 09 4D 6F 20 6D
0BF1:C7 ED 96 BA 20 13 EE 99 AA
0BF9:A5 6B A5 90 29 40 D0 03 6A
0C01:C8 B3 68 8C 6F 16 03 93 AD
0C09:EF D8 26 A9 3F 31 24 15 CA
0C11:D3 B9 5F B0 D1 CC E9 BC CA
0C19:48 1F E7 92 D0 D0 F9 4C 2F
0C21:10 08 1B F6 C1 01 AD E7 6B
0C29:29 C8 A1 F6 AD 9C C0 08 15
0C31:9A 6D 15 53 75 A9 03 8D 67
0C39:00 4C 91 49 8D 01 89 30 DE
0C41:8D 02 29 A9 3A 8D 03 29 97
0C49:4C 5F 0D F4 F2 20 0C ED 6E
0C51:A9 FF 20 B9 ED 20 FE ED B9
0C59:4C 7E 0D 8D EF 55 F8 AC 25
0C61:29 1E D3 D8 45 80 3A AF ED
0C69:20 E4 FF C9 20 F0 26 C9 42
0C71:11 F0 13 C9 91 D0 F1 C6 C7
0C79:E6 EB 07 D0 D4 A9 0B 50 A1
0C81:75 E6 BA A5 BA C9 0C D0 A5

0C89:C5 A9 08 85 BA 4C 1A 0E 91
0C91:4A BE 15 A9 A0 31 24 59 27
0C99:1C 8A B3 A6 BA A9 00 20 DF
0CA1:CD BD 54 16 25 31 36 4A A0
0CA9:7F 20 7A 0C 20 A3 FD 20 45
0CB1:18 E5 AD B2 DD 18 03 AD 33
0CB9:B3 0F 8D 19 03 20 29 0A A7
0CC1:A9 4C A0 15 20 4E 09 AE 22
0CC9:1B 0F CA 64 7E 45 A0 00 1D
0CD1:B1 FC 45 17 C8 98 DD 00 80
0CD9:28 D0 F4 A9 22 B6 04 2C 93
0CE1:4D 10 A3 D2 FF A9 13 8D A0
0CE9:77 B1 23 78 1A 52 8D 79 C4
0CF1:99 55 8D 7A C8 44 4E 8D 07
0CF9:7B 26 0D 8D 7C 02 A9 06 19
0D01:85 C6 4C 7A A4 B2 3B 75 7C
0D09:24 30 3A 2A 3D 50 00 92 E8
0D11:00 01 02 03 04 05 06 07 23
0D19:08 09 0A EC 3B 0D 0E 0F C2
0D21:10 11 12 13 14 15 16 17 33
0D29:18 19 1A 1B 1C 1D 1E 1F 3B
0D31:80 81 82 83 84 85 86 87 43
0D39:88 89 8A 8B 8C 8D 8E 8F 4B
0D41:90 91 92 93 94 95 96 97 53
0D49:98 99 9A 9B 9C 9D 9E 9F 5B
0D51:B1 85 2F 40 2A 55 31 C9 62
0D59:30 B0 38 20 30 00 42 2D F3
0D61:50 3A 32 20 31 36 32 00 41
0D69:0B 0C 73 BE AE CE 0F 0C 41
0D71:0B E6 06 0E 02 BE 01 7E F7
0D79:0E 06 8A 0B 02 0A 07 0F 73
0D81:01 0F 07 0A 03 DB 86 0D FA
0D89:03 07 01 07 03 DD 05 B4 82
0D91:00 00 05 08 93 11 D5 B8 12
0D99:52 EF C9 FB 0C B3 60 48 0A
0DA1:B2 5C 4A 40 81 09 C9 B0 ED
0DA9:C0 38 6D 92 93 2A 24 E2 79
0DB1:D0 1C BC CC 99 86 D5 C4 F6
0DB9:0E 21 EA 0C 93 B3 3C AB D0
0DC1:C0 20 AB B2 8C AA 47 CE 51
0DC9:C0 41 CA A9 2C 10 32 0C 9A
0DD1:A1 C9 FB 59 A6 72 0C 82 DD
0DD9:21 41 00 82 79 CB FE A0 96
0DE1:C8 87 B1 57 C4 DD CA 10 B2
0DE9:30 CB 11 99 BF 2C 2B A6 76
0DF1:E1 39 58 69 0D 9E 10 C8 B8
0DF9:24 D6 4D 45 44 D2 2B 0D AA
0E01:96 39 14 50 59 81 B8 47 C7
0E09:48 54 20 28 43 29 20 31 15
0E11:39 39 EF 02 43 4F 4D 9D C5
0E19:54 45 21 C9 44 55 42 4C B9
0E21:9B 62 4C 54 44 93 11 9C A1
0E29:2D 5A AC 89 49 4E 47 E3 96
0E31:44 0D 0E 2E C0 36 C3 BF 7D
0E39:97 49 57 41 49 54 4C 2E D4
0E41:0D 00 05 93 B0 41 AC 4D EE
0E49:7E AE 9F 95 B8 5A 2D 78 9F
0E51:97 56 31 2E 33 20 42 61 D7
0E59:99 4A 4F E2 56 4F 2A 42 8B
0E61:55 3D 5A 67 DD 35 18 2D 5A
0E69:3D 20 54 48 D5 A4 45 41 48
0E71:53 53 50 52 4F 47 52 E7 5F
0E79:FA 20 4C 4F 41 37 95 52 FD
0E81:20 3D 2D 99 02 20 DD AD 36
0E89:94 C0 C0 BD 9A BE AC 2A 67
0E91:3A F4 83 53 16 45 CF C5 D8
0E99:43 BF 42 00 FB 44 52 49 6E
0EAL:56 4C 97 05 30 99 92 79 C5
0EA9:41 9B 37 F3 A4 F8 41 4D 4C
0EB1:A8 90 2C 04 F9 5C 44 FF D5

PROGRAMS

```
0EB9:1F 9A 12 00 92 14 E8 AF B4
0EC1:99 87 29 F4 8E 49 74 B2 36
0EC9:71 94 C6 28 46 49 4C 45 54
0ED1:20 23 B3 72 4F 46 09 F9 04
0ED9:00 0D 91 4E 20 1D 99 29 22
0EE1:0D 9A 5F 05 FA B7 05 21 49
0EE9:D0 A4 6F 20 11 1B E8 A3 F1
0EF1:77 AB A8 46 31 8D 2D 0C 54
0EF9:52 72 C0 30 33 46 33 23 33
0F01:18 26 F0 41 6C DD 9B 15 0E
0F09:86 46 35 62 5C 61 44 4F 09
0F11:88 43 4F 4D 4D 32 1D 53 C3
0F19:0D 0D AE 12 D1 46 38 20 30
0F21:92 49 4A 57 F1 A1 5F 92 01
0F29:52 73 20 46 49 9C D8 20 44
0F31:4F 4E CF AF 13 00 9E 95 EA
0F39:3B C5 E1 B9 11 3E AD A5 C0
0F41:D4 EB D1 F5 B0 C4 1B 3C 69
0F49:53 48 49 46 8C F2 4C 84 FD
0F51:DE 53 45 2C 1D 27 55 4E 9D
0F59:2F CF CE 4F 50 20 54 4F CC
0F61:2B 58 80 07 21 99 32 96 16
0F69:C5 B0 94 2D 47 59 20 4B 27
0F71:45 59 E2 0A 2E D0 18 24 8E
0F79:30 63 C4 76 53 57 49 54 67
0F81:43 48 D8 55 89 08 8E 45 92
0F89:49 4E D0 52 EB C1 4E 45 67
0F91:57 CE B9 49 53 4B F9 56 EC
0F99:9C 85 18 B7 05 5C B2 95 74
0FA1:9B B4 97 12 48 9B 20 02 C1
0FA9:5F 44 4F 91 43 4F 4D 4D CA
0FB1:49 79 62 9B 20 48 20 97 14
0FB9:20 0D 11 9E EC 96 75 63 47
0FC1:05 07 C2 09 99 09 99 52 83
0FC9:4E 28 02 2E 4C D0 99 53 59
0FD1:54 41 54 55 70 36 62 76 E1
0FD9:49 C4 00 9A 93 12 08 11 7D
0FE1:08 87 60 53 45 4C 45 43 50
0FE9:5A 45 42 4F 4F 54 20 44 14
0FF1:45 56 49 6E CB 20 3A 20 CB
0FF9:9E 00 0D 9A 66 01 70 20 EA
1001:41 4E 44 20 50 52 45 53 89
1009:53 20 3C 53 50 41 43 45 EA
1011:3E 0D 00 93 4C 4F 41 44 33
1019:22 3A 2A 22 00 BE 80 3B 77
1021:CE 6E 60 01 1A 25 A3 EE FB
1029:30 3E C9 43 46 60 DE 63 33
1031:26 2C 9B E5 C0 8B DC 0F 3E
1039:87 60 D8 7C B9 C4 98 C1 EB
1041:62 E6 44 1E 4F 9F 45 6C A6
1049:78 6C 2C 1F 02 E0 F5 02 B9
1051:11 16 76 7F 6E B1 7C 91 FA
1059:C3 35 0F 60 CB CE 6E 36 3D
1061:8B C0 66 1F 7A 67 24 F3 E3
1069:74 63 1E 62 8E 22 B9 2C 23
1071:26 27 32 7E 98 8F 8C 2C 7B
1079:82 17 4E 7E 6B B3 78 8A F7
1081:4B 98 1C 36 78 30 25 4A 6D
1089:94 3C B6 08 AB 98 EB 24 16
1091:4A 10 30 7F 7F 30 10 82 38
1099:05 00 B6 1C C1 03 E3 29 DF
10A1:C1 98 09 FF 66 C0 13 6A B0
10A9:B6 3C F3 7A 62 57 33 63 94
10B1:0C 2E 85 38 6C 6C 3E 74 9D
10B9:6D E3 95 0C F6 5A D6 30 FE
10C1:FE AD 24 3E 24 58 7E A9 5E
10C9:6D 96 A7 D8 44 4F 02 60 8C
10D1:3C 02 D6 26 61 93 FC 21 42
10D9:AC 37 18 38 C2 84 1D 60 67
10E1:D9 15 49 3C E9 4F 66 66 E0
```

```
10E9:7E E5 A9 7E 5E 7A 3E 60 99
10F1:7C 55 3E 7C 35 80 33 12 59
10F9:66 3C 80 07 E4 3E 06 7C 85
1101:E6 A1 79 20 22 2B 95 06 1F
1109:F2 0C 06 55 34 48 7E 38 B5
1111:00 60 30 18 30 60 00 00 D5
1119:3C 66 0C 18 00 18 00 80 D6
1121:7C C8 C8 C8 A9 00 85 10 C1
1129:A6 FB 30 0D 06 FA 2A 26 0B
1131:10 C6 FB 88 D0 F2 AA 18 D4
1139:60 48 A1 FF 85 FA A2 07 36
1141:86 FB E4 FF A6 FE D0 02 17
1149:C6 FF C6 FE 68 90 DD E0 B9
1151:E7 D0 D9 A9 37 85 01 58 9B
1159:4C A2 01 A9 10 85 04 AA 4E
1161:BC D8 07 20 32 07 A6 04 F9
1169:7D C7 07 48 A5 10 69 00 E1
1171:E0 0F 69 00 A8 68 A6 02 2B
1179:D0 08 C0 00 D0 04 C9 10 58
1181:F0 D9 18 65 FC AA 98 65 15
1189:FD 85 49 A4 11 F0 20 8A 96
1191:38 E5 11 B0 03 C6 49 38 74
1199:85 48 A5 FC E5 11 B0 02 EB
11A1:C6 FD 85 FC B1 48 88 91 78
11A9:FC C6 01 EE 20 D0 E6 01 1E
11B1:98 D0 F1 60 44 4D 26 52 8E
11B9:4F 00 04 0C 1C 3C 7C BC 4C
11C1:FE 00 08 10 20 41 81 C5 34
11C9:00 80 02 03 04 05 06 06 C2
11D1:06 07 03 03 04 05 06 06 8F
11D9:06 07 07 00 0B 08 C4 07 AA
11E1:9E 20 28 32 30 36 34 29 6F
11E9:F1 05 00 AD 31 8D B2 14 5A
11F1:CF 06 8D B3 8A 80 86 BF 8D
11F9:F1 90 EA 8D 19 03 B4 71 1F
1201:85 FD A9 D0 A2 8D F7 78 5D
1209:C0 78 A9 33 4F 55 BE 00 61
1211:00 18 21 11 B9 0F 11 99 36
1219:1C 07 C8 D0 F7 20 31 07 DC
1221:F0 46 20 31 07 D0 30 20 62
1229:30 07 69 02 C9 04 90 27 1B
1231:D0 07 20 31 07 69 04 D0 4D
1239:1E 20 2F 07 69 06 C9 0D CE
1241:D0 11 C8 20 2F 07 69 0D A2
1249:C9 0D D0 07 A0 05 20 32 AB
1251:07 69 1D EE 00 04 EA 85 51
1259:11 A6 FE A5 FF 20 97 07 A0
1261:A5 49 85 FF A5 48 85 FE B3
1269:20 31 07 85 02 F0 14 0A 29
1271:2C A9 03 85 11 20 F7 07 3D
1279:A6 02 D0 02 69 08 20 6B C2
1281:07 F0 9A 20 31 07 F0 B9 2C
1289:20 30 07 69 04 C9 06 90 25
1291:E2 D0 07 20 30 07 69 06 B4
1299:D0 D9 A0 05 20 32 07 69 42
12A1:0A C9 D0 F0 0D C9 12 D0 72
12A9:CA A0 02 20 32 07 69 2A 48
12B1:D0 C1 A0 06 D0 F5 A9 00 D4
12B9:85 2D A9 18 85 2E 4C 10 30
12C1:08 A9 18 85 2E 4C 10 08 7A
12C9:C6 01 58 A7 A2 CD 12 D0 58
12D1:D0 34 A2 06 A9 FF 95 F8 91
12D9:BD 90 03 95 F7 CA 10 4B
12E1:F3 A2 12 BD A0 03 4D 5E D0
12E9:03 9D E8 07 CA 10 F4 A9 AE
12F1:13 A2 E8 A0 07 20 97 03 5A
12F9:A9 0F A8 A2 08 20 94 03 E2
1301:20 9A 03 20 9D 03 29 00 8B
1309:A8 78 E6 01 B9 0F 12 99 56
1311:FA 00 C8 D0 F7 4C 00 01 CC
```

```
1319:BA BD C0 E7 6C F7 00 6C 52
1321:F9 00 6C FB 00 6C FD 00 3F
1329:4D 7D 77 0E 02 01 1A 14 81
1331:03 62 19 05 08 6D 0B 02 F2
1339:1F 0E 08 1A 1A 1A 1A 9C
1341:1A 1A 1A 1A 1A 1A 1A 67
1349:1A 1A 1A 1A 1A 1A 1A 6F
1351:1A 1A 1A 1A 1A 1A 1A 77
1359:1A 1A 1A 1A 1A 1A 1A 7F
1361:1A 1A 1A 1A 1A 1A 1A 87
1369:1A 1A 1A 1A 1A 1A 1A 8F
1371:1A 1A 1A 1A 1A 1A 1A 97
1379:1A 1A 1A 1A 1A 00 00 51
```

Joe Votour keeps track of his files in Hanmer, Ontario, Canada.

STOCK ANALYSIS 128

By Philip Addeo

Stock Analysis 128 is a full-fledged stock advisory program, not a simulation program or a game. Although admittedly not as sophisticated as the programs the big boys use, this program can be very useful in evaluating your stock portfolio or in tracking the stock market as a whole.

This 128 program is written entirely in BASIC 7. It's easy to use and requires the 128 to be in 80-column mode. To help avoid typing errors, enter the program with The Automatic Proofreader. See "Typing Aids" elsewhere in this section. Be sure to save a copy of the program before exiting Proofreader.

What You Need

To use Stock Analysis 128, you'll need the weekly closing stock prices printed in larger daily newspapers, usually on Saturday or Sunday. You'll also need the total stock price advances and declines and Standard & Poor's (S&P's) 500 closing price.

Before using the program, you must decide which stocks you'd like in your file. You can have any number of stocks in a file, but I'd suggest a maximum of 20. Things can get a little cumbersome if you have more than that. Of course, you can have any number of different files. The program requires three weeks of stock data to start, and data must be entered on a weekly basis for the program to be useful.

Getting Started

The opening menu of Stock Analysis 128 gives you four options: update an existing file, analyze an existing file,

open a new file, and quit.

To start, choose option 3, open a new file, and follow the prompts for entering the filename and stock data. Use option 3 to open as many new files as you need. Use option 1 to update your files weekly. Use option 2 to analyze your files.

The program's main body consists of three screens. The first one displays general market trends for the past three weeks, which include advances, declines, and an advance/decline index. The second screen displays S&P's 500 data for the past three weeks, which include short-, medium-, and long-term trends; the trend's direction; and a market indicator. The third screen is the main analysis screen and displays the name of the stock, three weeks of data, trends, and a recommendation for each individual stock in your file.

STOCK ANALYSIS 128

PK 5 REM COPYRIGHT 1993 - COMP
UTE PUBLICATIONS INTL LTD
- ALL RIGHTS RESERVED

```
SA 10 FAST
QA 20 L$="":A$=CHR$(176):B$=CHR$(99):D$=CHR$(174):E$=CHR$(98):Z$=E$
DS 30 I$=CHR$(173):K$=CHR$(189)
DD 40 L1$="*****"
*****
*****
*****
DK 50 L2$="....."
.....
.....
.....
XF 60 DIMA(250):Z$=CHR$(13)
FJ 70 PRINT"{CLR}{RVS}
{9 SPACES}{SHIFT-SPACE}
{20 SPACES}STOCK MARKET
{SPACE}ANALYSIS
{29 SPACES}{OFF}"
CR 80 PRINT"{DOWN}":GOSUB2190
CK 90 PRINTTAB(31)"{RVS}1.
{OFF} UPDATE FILE"
AR 100 PRINTTAB(31)"{RVS}2.
{OFF} STOCK ADVISOR"
XK 110 PRINTTAB(31)"{RVS}3.
{OFF} OPEN NEW FILE"
CA 120 PRINTTAB(31)"{RVS}4.
{OFF} QUIT"
QP 130 PRINTTAB(35)"{2 DOWN}CHOICE":INPUT I
XQ 140 IF I<101 THEN PRINT"
{4 UP}":GOTO130
PS 150 IF I=4 THEN L70
PJ 160 ONIGOTO410,1060,180
```

```
RA 170 END
SG 180 PRINT"{CLR}{RVS}
{11 SPACES}CREATE NEW FILE{14 SPACES}"
FX 190 INPUT"{DOWN}WHAT IS THE NAME OF NEW FILE":NFS
JE 200 INPUT"{DOWN}HOW MANY STOCKS IN FILE":M
MA 210 DOPEN#1,(NFS),W
QA 220 INPUT"{CLR}{2 DOWN}ENTER WEEKS CLOSING ADVANCES, DECLINES{5 SPACES}":A,D
MA 222 INPUT"{DOWN}ENTER LAST {SPACE}WEEKS CLOSING ADVANCES, DECLINES {2 SPACES}":A1,D1
EB 224 INPUT"{DOWN}ENTER WEEK {SPACE}BEFORE CLOSING ADVANCES, DECLINES ":A2,D2
PR 230 INPUT"{DOWN}ENTER WEEKS CLOSING PRICE OF S&P 500{9 SPACES}":S
FR 240 INPUT"{DOWN}ENTER LAST {SPACE}WEEKS CLOSING PRICE OF S&P 500 {4 SPACES}":S1
EM 250 INPUT"{DOWN}ENTER WEEK {SPACE}BEFORE CLOSING PRICE OF S&P 500 {3 SPACES}":S2
HD 260 FORJ=0 TO 3:A(J)=A-D:NEXT
AR 270 FORJ=4 TO 13:A(J)=S:NEXT
FF 280 PRINT#1,M
SD 290 PRINT#1,A(0):Z$:A(1):Z$:A(2):Z$:A(3):Z$:A(4):Z$:A(5):Z$:A(6)
EQ 300 PRINT#1,A(7):Z$:A(8):Z$:A(9):Z$:A(10):Z$:A(11):Z$:A(12):Z$:A(13)
PE 310 PRINT#1,S1:Z$:S2:Z$:A:Z$:A1:Z$:A2:Z$:D:Z$:D1:Z$:D2
PX 320 FORK=1 TO M
AQ 330 PRINT"{CLR}{2 DOWN}ENTER NAME OF STOCK NUMBER {SPACE}"K"{DOWN}":INPUT A$
GJ 340 INPUT"{DOWN}ENTER END OF WEEK CLOSING PRICE: {SPACE}":X
JG 350 INPUT"{DOWN}ENTER LAST {SPACE}WEEKS CLOSING PRICE{2 SPACES}":X1
SG 360 INPUT"{DOWN}ENTER WEEK {SPACE}BEFORE CLOSING PRICE: ":X2
CF 370 FORJ=1 TO 10:A(J)=X:PRINT"HOME">{6 DOWN}":NEXT
QG 380 PRINT#1,A$:Z$:A(1):Z$:A(2):Z$:A(3):Z$:A(4):Z$:A(5):Z$:A(6)
QJ 390 PRINT#1,A(7):Z$:A(8):Z$:A(9):Z$:A(10):Z$:X1:Z$:X2
QD 400 NEXT:DCLOSE:RUN
```

```
GK 410 INPUT"{CLR}{4 DOWN}WHAT IS NAME OF FILE YOU WISH TO ANALYZE":FS
FP 420 PRINT"{CLR}{RVS}
{8 SPACES}UPDATE STOCK {SPACE}PRICES
{13 SPACES}{OFF}"
GG 430 DOPEN#1,(FS)
CG 440 INPUT#1,M,A(0),A(1),A(2),A(3),A(4),A(5),A(6)
HQ 450 INPUT#1,A(7),A(8),A(9),A(10),A(11),A(12),A(13),S1,S2,A,A2,A3,D,D1,D2
KD 460 S2=S1:S1=A(4):A3=A2:A2=A:D2=D1:D1=D
AK 470 PRINT"{DOWN}{7 SPACES}{RVS}GENERAL MARKET INFORMATION{OFF}"
PP 480 INPUT"{2 DOWN}ENTER ADVANCES, DECLINES, S&P 500":A,D,S
GM 490 PRINT"{2 DOWN}"A,D,S:Y=1:N=0:INPUT"{DOWN}ANY {2 SPACES}CHANGES Y/N":X$
DR 500 IF X$="Y" THEN 480
DB 510 A1=A-D
QS 520 A(0)=A(0)+A1:A(3)=A(2):A(2)=A(1)
MS 530 A(1)=.875*A(2)+.125*A(0)
MQ 540 A(4)=S:A(7)=A(6):A(6)=A(5)
MB 550 A(5)=INT(66.67*A(6)+33.33*S)/100
CM 560 A(10)=A(9):A(9)=A(8)
JG 570 A(8)=INT(87.5*A(9)+12.5*S)/100
BJ 580 A(13)=A(12):A(12)=A(11)
ED 590 A(11)=INT(95*A(12)+5*S)/100
DP 600 GOTO660
QM 610 FORJ=0 TO 13:PRINTJ,A(J):NEXT
EF 620 INPUT"{DOWN}ANY {2 SPACES}CHANGES Y/N":X$
KD 630 IF X$="N" THEN 660
PE 640 INPUT"{DOWN}ITEM # AND {SPACE}CHANGE":J,A(J)
RQ 650 GOTO660
FG 660 DIMB$(M):FORI=1 TO M
BH 670 L=12*I+1
QA 680 INPUT#1,B$(I),A(L+1),A(L+2),A(L+3),A(L+4),A(L+5)
QR 690 INPUT#1,A(L+6),A(L+7),A(L+8),A(L+9),A(L+10)
RE 700 INPUT#1,A(L+11),A(L+12)
XC 710 A(L+12)=A(L+11):A(L+11)=A(L+1)
PS 720 PRINT"{CLR}{DOWN}STOCK:":B$(I)
RK 730 PRINT"{DOWN}LAST WEEKS {SPACE}PRICE WAS":A(L+1)
GH 740 INPUT"{DOWN}ENTER THIS
```


PROGRAMS

```

{SPACE}WEEKS PRICE";P
DQ 750 INPUT "{DOWN}ANY
      {2 SPACES}CHANGES Y/N";
      XS
SX 760 IFXS="Y"THEN720
JP 770 A(L+1)=P:A(L+4)=A(L+3):
      A(L+3)=A(L+2)
JG 780 A(L+2)=INT(66.67*A(L+3)
      +33.33*P)/100
JG 790 A(L+7)=A(L+6):A(L+6)=A(
      L+5)
BD 800 A(L+5)=INT(87.5*A(L+6)+
      12.5*P)/100
DK 810 A(L+10)=A(L+9):A(L+9)=A
      (L+8)
MF 820 A(L+8)=INT(95*A(L+8)+5*
      P)/100
FQ 830 GOTO890
PG 840 FORJ=1TO12:PRINTJ,A(L+J
      ):NEXT
BG 850 INPUT "{DOWN}ANY
      {2 SPACES}CHANGES Y/N";
      XS
XH 860 IFXS="N"THEN890
AA 870 INPUT "{DOWN}ITEM # AND
      {SPACE}CHANGE";J,A(L+J)
PQ 880 GOTO830
MM 890 NEXT
CB 900 DCLOSE
BS 910 PRINT "{CLR}{DOWN}THAT'S
      ALL THE STOCKS IN THE
      {SPACE}FILE{2 SPACES}"
FJ 920 FORT1=1TO2000:NEXT
SB 930 DOPEN#1,"@"+(FS),W
CQ 940 PRINT#1,M
BP 950 PRINT#1,A(0);Z$;A(1);Z$
      ;A(2)
SR 960 PRINT#1,A(3);Z$;A(4);Z$
      ;A(5);Z$;A(6);Z$;A(7);Z$
      ;A(8);Z$;A(9);Z$;A(10)
BA 970 PRINT#1,A(11);Z$;A(12);
      Z$;A(13);Z$;S1;Z$;S2;Z$
      ;A$;A2;Z$;A3
MQ 980 PRINT#1,D;Z$;D1;Z$;D2
JJ 990 FORI=1TOM
HA 1000 L=12*I+1
ED 1010 PRINT#1,BS(I);Z$;A(L+1
      );Z$;A(L+2);Z$;A(L+3);
      Z$;A(L+4);Z$;A(L+5)
MM 1020 PRINT#1,A(L+6);Z$;A(L+
      7);Z$;A(L+8);Z$;A(L+9)
      ;Z$;A(L+10)
JE 1030 PRINT#1,A(L+11);Z$;A(L
      +12)
BQ 1040 NEXT:DCLOSE
HA 1050 PRINT "{DOWN}ALL DATA H
      AVE{2 SPACES}BEEN RECO
      RDED":FORZ=1TO2000:NEX
      T
JC 1060 M=0:K=0
GX 1070 DB$="{YEL} DON'T BUY
      {OFF}{21 SPACES}"
JE 1080 DBB$="{YEL} DON'T BUY
      {SPACE}(BEAR) {OFF}
      {14 SPACES}"
CG 1090 HSS="{PUR} HOLD STOCK
      {SPACE}{OFF}
      {20 SPACES}"
CH 1100 ASS="{YEL} AVOID STOCK
      {OFF}{19 SPACES}"
GD 1110 SSS="{CYN} SELL STOCK
      {SPACE}{OFF}
      {20 SPACES}"
KJ 1120 BSS="{CYN} BUY STOCK
      {OFF}{21 SPACES}"
KF 1130 SFS="{YEL} STAY FULLY
      {SPACE}INVESTED (BULL)
      {OFF}{4 SPACES}"
FH 1140 UCS="{WHT} UNCERTAIN--
      DON'T BUY {OFF}
      {10 SPACES}"
JH 1150 INS="{WHT} INCONCLUSIV
      E {OFF}{18 SPACES}"
RF 1160 WAS="{YEL} WAIT FOR CL
      EARER MARKET TRENDS
      {OFF}"
AB 1170 INPUT "{CLR}{4 DOWN}WHA
      T IS NAME OF FILE YOU
      {SPACE}WISH TO ANALYZE
      ";FS
QQ 1180 DOPEN#1,(FS)
FF 1190 PRINT "{CLR}{WHT}{RVS}
      {18 SPACES}PERSONAL ST
      OCK ADVISOR GENERAL MA
      RKET TRENDS{18 SPACES}
      {OFF}"
GC 1200 PRINTTAB(29)"{DOWN}
      {RVS} ADVANCES AND DEC
      LINES {RVS}":PRINT
CF 1210 GOSUB2280
KE 1220 PRINTL$
BE 1230 INPUT#1,M,A(0),A(1),A(
      2),A(3),A(4),A(5),A(6)
      ,A(7),A(8),A(9),A(10),
      A(11),A(12)
SX 1240 INPUT#1,A(13),S1,S2,A1
      ,A2,A3,D,D1,D2
KF 1250 Y=0:IF(A1>A2)AND(A2>A3
      )THENY=1:A=Y
JD 1260 IF(A1<A2)AND(A2<A3)THE
      NY=-1:A=Y
RA 1270 FORJ=1TO3:A(J)=INT(A(J
      )):NEXT
KM 1280 PRINT "{DOWN}ADVANCES";
      TAB(21);:PRINTUSING"##
      ###";A1;:PRINTSPC(10);
      :PRINTUSING"#####";A2;
      :PRINTSPC(10);:PRINTUS
      ING"#####";A3;:GOSUB21
      60
QP 1290 Y=0:IF(D>D1)AND(D1>D2)
      THENY=1:A=Y
SP 1300 IF(D<D1)AND(D1<D2)THEN
      Y=-1:A=Y
JQ 1310 PRINT "{DOWN}DECLINES";
      TAB(21);:PRINTUSING"##
      ###";D;:PRINTSPC(10);:
      PRINTUSING"#####";D1;:
      PRINTSPC(10);:PRINTUSI
      NG"#####";D2;:GOSUB216
      0
AD 1320 Y=0:IF(A(1)>(A2))AND(A
      (2)>A(3))THENY=1:A=Y
CQ 1330 IF(A(1)<A(2))AND(A(2)<
      A(3))THENY=-1:A=Y
FR 1340 PRINT "{DOWN}A/D INDEX"
      ;TAB(21);:PRINTUSING"##
      ###";A(1);:PRINTSPC(1
      0);:PRINTUSING"#####";
      A(2);:PRINTSPC(10);:PR
      INTUSING"#####";A(3);:
      GOSUB2160
JG 1350 PRINT "{DOWN}"L2S
QR 1360 PRINTCHR$(158)TAB(30)"
      {2 DOWN}ANY KEY TO CON
      TINUE"
HA 1370 GETKS:IEKS$="{THEN1370
      PRINT "{CLR}{WHT}{RVS}
      {18 SPACES}PERSONAL ST
      OCK ADVISOR GENERAL MA
      RKET TRENDS{18 SPACES}
      {OFF}"
DP 1390 PRINTTAB(35)"{DOWN}
      {RVS} S & P 500 {RVS}"
      :PRINT
QB 1400 GOSUB2280
KA 1410 PRINTL$
DG 1420 Y=0:IF(A(1)>A(2))AND(A
      (1)>A(3))THENY=1:A=Y
JG 1430 IF(A(1)<A(2))AND(A(2)<
      A(3))THENY=-1:A=Y
DR 1440 FORJ=1TO3:A(J)=INT(A(J
      )):NEXT
XM 1450 Y=0:IF(A(5)>A(6))AND(A
      (6)>A(7))THENY=1
QQ 1460 IF(A(5)<A(6))AND(A(6)<
      A(7))THENY=-1
KG 1470 PRINT "{DOWN}{YEL}SHORT
      "TAB(19);:PRINTUSING"S
      #####";A(5);:PRINTSP
      C(7);:PRINTUSING"#####"
      .###";A(6);:PRINTSPC(7)
      ;:PRINTUSING"#####";
      A(7);
HF 1480 GOSUB2160
FK 1490 Y=0:IF(A(8)>A(9))AND(A
      (9)>A(10))THENY=1
GD 1500 IF(A(8)<A(9))AND(A(9)<
      A(10))THENY=-1
MA 1510 PRINT "{DOWN}{CYN}MEDIU
      M"TAB(19);:PRINTUSING"
      #####";A(8);:PRINTS
      PC(7);:PRINTUSING"####
      .###";A(9);:PRINTSPC(7)
      ;:PRINTUSING"#####";
      A(10);
XH 1520 GOSUB2160
BA 1530 Y=0:IF(A(11)>A(12))AND
      (A(12)>A(13))THENY=1:L
      =Y
KQ 1540 IF(A(11)<A(12))*A(12)
      <A(13))THENY=-1:L=Y
AJ 1550 PRINT "{DOWN}{6}LONG"TA
      B(19);:PRINTUSING"####
      .###";A(11);:PRINTSPC(
      7);:PRINTUSING"#####";
      A(12);:PRINTSPC(7);
      :PRINTUSING"#####";
      A(13);
DJ 1560 GOSUB2160
DP 1570 Y=0:IF(A(4)>(S1))AND((

```



```

DA 1580 S1)>(S2)) THENY=1:A=Y
MR 1590 IF(A(4)<(S1)) AND((S1)<
PRINT"{DOWN}{WHT}LEVEL
"TAB(19);:PRINTUSING"$
####.##";A(4);:PRINTSP
C(7);:PRINTUSING"$####
.##";S1;:PRINTSPC(7);:
PRINTUSING"$####.##";S
2;
KB 1600 GOSUB2160:PRINTL2S
GD 1610 PRINT"INDICATION:
{RVS}";
RJ 1620 IF(A=0) AND(L=0) THENPRI
NTINS:B=0:GOTO1730
SF 1630 IF(A=1) AND(L=1) AND(A(8
)>A(11)) THENPRINTSF$:B
=1:GOTO1730
MS 1640 IF(A=1) AND(L=1) AND(A(8
)<A(11)) THENPRINTUC$:B
=0:GOTO1730
RB 1650 IF(A=-1) AND(L=-1) AND(A
(8)>A(11)) THENPRINTUC$:
B=0:GOTO1730
SS 1660 IF(A=-1) AND(L=1) AND(A(
8)<A(11)) THENPRINTDB$:
B=-1:GOTO1730
RS 1670 IF(A=-1) AND(L=-1) AND(A
(5)<A(11)) AND(A(8)<A(1
1)) THENPRINTDB$:B=-1:G
OTO1730
FG 1680 IF(A=1) AND(L=-1) AND(A
(5)>A(11)) AND(A(8)<A(1
1)) THENPRINTBS$:B=1:G
OTO1730
MB 1690 IF(A=1) AND(L=-1) AND(A(
5)<A(11)) AND(A(8)<A(1
1)) THENPRINTBS$:B=1:G
OTO1730
HH 1700 IF(A=1) AND(L=-1) AND(A(
5)>A(11)) AND(A(8)<A(1
1)) THENPRINTBS$:B=1:G
OTO1730
KS 1710 IF(A=1) AND(L=-1) AND(A(
5)>A(11)) AND(A(8)>A(1
1)) THENPRINTBS$:B=1:G
OTO1730
CE 1720 B=0:PRINTINS
PE 1730 PRINTCHR$(158)TAB(30)"
{2 DOWN}ANY KEY TO CON
TINUE"
RJ 1740 GETK$:IFK$="" THEN1740
EP 1750 PRINT"{CLR}{CYN}{RVS}
{30 SPACES}PERSONAL ST
OCK ADVISOR{28 SPACES}
{OFF}"
JS 1760 FORK=1TOM
CP 1770 INPUT#1,A$,A(14),A(15)
,A(16),A(17),A(18)
PR 1780 INPUT#1,A(19),A(20),A(
21),A(22),A(23),A(24),
A(25)
BA 1790 PRINT"{HOME}{2 DOWN}"T
AB(8)"{57 SPACES}"
BB 1800 PRINTCHR$(2)"{HOME}
{2 DOWN}{CYN} STOCK:
{WHT}";A$:PRINT"{CYN}"
:GOSUB2280
MG 1810 PRINT"{CYN}"L1$
FA 1820 Y=0:IF(A(15)>A(16)) AND
(A(16)>A(17)) THENY=1
QE 1830 IF(A(15)<A(16)) AND(A(1
6)<A(17)) THENY=-1
QB 1840 PRINT"{DOWN}{YEL}SHORT
"TAB(19);:PRINTUSING"$
####.##";A(15);:PRINTSP
C(8);:PRINTUSING"$####
.##";A(16);:PRINTSPC(9)
;:PRINTUSING"$####.##";
A(17);
BM 1850 GOSUB2160
AS 1860 Y=0:IF(A(18)>A(19)) AND
(A(19)>A(20)) THENY=1
SH 1870 IF(A(18)<A(19)) AND(A(1
9)<A(20)) THENY=-1
PM 1880 PRINT"{DOWN}{CYN}MEDIU
M"TAB(19);:PRINTUSING"
$####.##";A(18);:PRINTS
PC(8);:PRINTUSING"$####
.##";A(19);:PRINTSPC(9)
;:PRINTUSING"$####.##"
;A(20);
RS 1890 GOSUB2160
SC 1900 Y=0:IF(A(21)>A(22)) AND
(A(22)>A(23)) THENY=1:L
=Y
RH 1910 IF(A(21)<A(22)) AND(A(2
2)<A(23)) THENY=-1:L=Y
FD 1920 PRINT"{DOWN}{6}LONG"TA
B(19);:PRINTUSING"$####
.##";A(21);:PRINTSPC(8)
;:PRINTUSING"$####.##"
;A(22);:PRINTSPC(9);:P
RINTUSING"$####.##";A(2
3);
EB 1930 GOSUB2160
GD 1940 Y=0:IF(A(14)>A(24)) AND
(A(24)>A(25)) THENY=1:L
=Y
HF 1950 IF(A(14)<A(24)) AND(A(2
4)<A(25)) THENY=-1:L=Y
XJ 1960 PRINT"{DOWN}{WHT}PRICE
"TAB(19);:PRINTUSING"$
####.##";A(14);:PRINTSP
C(8);:PRINTUSING"$####
.##";A(24);:PRINTSPC(9)
;:PRINTUSING"$####.##";
A(25);
AC 1970 GOSUB2160
XM 1980 R=INT(100*(A(11)/A(21)
)* (A(15)/A(5))+.5)
FQ 1990 PRINTL2$:PRINTTAB(18)"
{DOWN}{6 SPACES}"
GQ 2000 PRINT"{UP}RELATIVE STR
ENGTH:";R;TAB(30);"REC
OMMENDATION: {RVS}";
QH 2010 IF(L=1) AND(A(15)>A(21)
) AND(A(18)>A(21)) THENP
RINTHSS$:GOTO2120
MA 2020 IF(L=-1) AND(A(15)<A(21)
) AND(A(18)<A(21)) THEN
PRINTASS$:GOTO2120
SK 2030 IFB=0 THENPRINTWAS$:GOTO
2120
DJ 2040 IF(B=1) AND(L=1) AND(A(1
8)>A(21)) AND(A(15)<A(1
8)) THENPRINTHSS$:GOTO21
20
HH 2050 IF(B=-1) AND(L=1) AND(A(
18)>A(21)) AND(A(15)<A(
18)) THENPRINTSS$:GOTO2
120
BK 2060 IF(B=1) AND(L=1) AND(A(1
8)>A(21)) AND(A(15)<A(2
1)) THENPRINTHSS$:GOTO21
20
DG 2070 IF(B=-1) AND(L=1) AND(A(
18)>A(21)) AND(A(15)<A(
21)) THENPRINTSS$:GOTO2
120
GA 2080 IF(B=1) AND(L=-1) AND(A(
18)<A(21)) AND(A(15)>A(
21)) THENPRINTBS$:GOTO2
120
DR 2090 IF(B=-1) AND(L=-1) AND(A
(18)<A(21)) AND(A(15)>A
(21)) THENPRINTDB$:GOTO
2120
SS 2100 IF(B=1) AND(A(18)>A(21)
) THENPRINTBS$:GOTO2120
EX 2110 PRINTINS
CA 2120 PRINTCHR$(158)TAB(30)"
{3 DOWN}ANY KEY TO CON
TINUE"
MK 2130 GETK$:IFK$="" THEN2130
MG 2140 NEXT
BH 2150 DCLOSE:PRINT"{CYN}":RU
N
HG 2160 IFY=1 THENPRINTTAB(72)"
UP ":RETURN
DH 2170 IFY=-1 THENPRINTTAB(72)
"DOWN":RETURN
GD 2180 PRINTTAB(72)"NONE":RET
URN
XQ 2190 REM{3 SPACES}BOX MAKER
PA 2200 PRINT"{HOME}{3 DOWN}"
KB 2210 FORI=1TO18:L$=L$+B$:NE
XT
GK 2220 Z1$=A$+L$+D$:PRINTTAB(
29)Z1$
XQ 2230 FORI=1TO18:Z2$=Z2$+" "
:NEXT:Z2$=Z2$+E$
XF 2240 FORI=1TO4:PRINTTAB(29)
Z2$:NEXT
CQ 2250 X$=I$+MID$(Z1$,2,18)+K
$
JC 2260 PRINTTAB(29)X$:PRINT"
{HOME}{4 DOWN}"
PS 2270 RETURN
AH 2280 PRINTTAB(22)"{WHT}THIS
"SPC(11)"LAST"SPC(11)"
WEEK"
AA 2290 PRINT" TRENDS"SPC(15)"
WEEK"SPC(11)"WEEK"SPC(
10)"BEFORE"SPC(12)"DIR
ECTION":RETURN

```

Philip Addeo is a biomedical engineer who lives in Roselle, New Jersey. He enjoys electronics, programming the 128, and classical guitar. □

THE AUTOMATIC PROOFREADER

Philip I. Nelson

The Automatic Proofreader helps you type in program listings for the 128 and 64 and prevents nearly every kind of typing mistake.

Type in Proofreader exactly as listed. Because the program can't check itself, be sure to enter each line carefully to avoid typographical errors or other mistakes. Don't omit any lines, even if they contain unusual commands. After you've finished, save a copy of the program before running it.

Next, type *RUN* and press Return. After the program displays the message *Proofreader Active*, you're ready to type in a BASIC program.

Every time you finish typing a line and press Return, Proofreader displays a two-letter checksum in the upper left corner of the screen. Compare this result with the two-letter checksum printed to the left of the line in the program listing. If the letters match, the line probably was typed correctly. If not, check for your mistake and correct the line. Also, be sure not to skip any lines.

Proofreader ignores spaces not enclosed in quotation marks, so you can omit or add spaces between keywords and still see a matching checksum. Spaces inside quotes are almost always significant, so the program pays attention to them.

Proofreader does not accept keyword abbreviations (for example, ? instead of PRINT). If you use abbreviations, you can still check the line by listing it, moving the cursor back to the line, and pressing Return.

If you're using Proofreader on the 128, do not perform any GRAPHIC commands while Proofreader is active. When you perform a command like GRAPHIC 1, the computer moves everything at the start of BASIC program space—including the Proofreader—to another memory area, causing Proofreader to crash. The same thing happens if you run any program with a GRAPHIC command while Proofreader is in memory.

Though Proofreader doesn't interfere with other BASIC operations, it's a good idea to disable it before running another program. To disable it, turn the computer off and then on. A gentler method is to SYS to the computer's built-in reset routine (65341 for the 128, 64738 for the 64).

AUTOMATIC PROOFREADER

```
0 CLR
10 VE=PEEK(772)+256*PEEK(773):
  LO=43:HI=44:PRINT "{CLR}
  {WHT}AUTOMATIC PROOFREADER
  {SPACE}FOR ";
20 IF VE=42364 THEN PRINT "64"
30 IF VE=17165 THEN LO=45:HI=4
  6:WAIT CLR:PRINT"128"
40 SA=(PEEK(LO)+256*PEEK(HI))+
  6:FOR J=SA TO SA+166:READ B
  :POKE J,B:CH=CH+B:NEXT
50 IF CH<>20570 THEN PRINT "*E
  RROR* CHECK TYPING IN DATA
  {SPACE}STATEMENTS":END
60 FOR J=1 TO 5:READ RF,LF,HF:
  RS=SA+RF:HB=INT(RS/256):LB=
  RS-(256*HB)
70 CH=CH+RF+LF+HF:POKE SA+LF,L
  B:POKE SA+HF,HB:NEXT
80 IF CH<>22054 THEN PRINT "*E
  RROR* RELOAD PROGRAM AND CH
  ECK FINAL LINE":END
90 IF VE=17165 THEN POKE SA+14
  ,22:POKE SA+18,23:POKE SA+29
  ,224:POKE SA+139,224
100 POKE SA+149,PEEK(772):POKE
  SA+150,PEEK(773):PRINT"
  {CLR}PROOFREADER ACTIVE"
110 SYS SA:POKE HI,PEEK(HI)+1:
  POKE (PEEK(LO)+256*PEEK(HI)
  )-1,0:NEW
120 DATA120,169,73,141,4,3,169
  ,3,141,5,3,88,96,165,20,13
  3,167
130 DATA165,21,133,168,169,0,1
  41,0,255,162,31,181,199,15
  7,227
140 DATA3,202,16,248,169,19,32
  ,210,255,169,18,32,210,255
  ,160
150 DATA0,132,180,132,176,136,
  230,180,200,185,0,2,240,46
  ,201
160 DATA34,208,8,72,165,176,73
  ,255,133,176,104,72,201,32
  ,208
170 DATA7,165,176,208,3,104,20
  8,226,104,166,180,24,165,1
  67
180 DATA121,0,2,133,167,165,16
  8,105,0,133,168,202,208,23
  9,240
190 DATA202,165,167,69,168,72,
  41,15,168,185,211,3,32,210
  ,255
200 DATA104,74,74,74,74,168,18
  5,211,3,32,210,255,162,31,
  189
210 DATA227,3,149,199,202,16,2
  48,169,146,32,210,255,76,8
  6,137
220 DATA65,66,67,68,69,70,71,7
  2,74,75,77,80,81,82,83,88
230 DATA 13,2,7,167,31,32,151,
  116,117,151,128,129,167,13
  6,137
```

ONLY ON DISK

Here are the bonus programs on this month's Gazette Disk.

Ezee Design

By Frank Kirsch
Milwaukee, WI

If you're an electronics hobbyist or professional, you'll use this outstanding reference program often. Ezee Design fills more than 125 blocks with problem-solving electronic formulas. It'll help you calculate problems dealing with Ohm's Law; capacitors, resistors, and inductors in series and parallel circuits; and more.

Use it to determine time constants, coil-winding specifications, resonant frequency, and wavelength calculations. It solves simultaneous equations and even illustrates the color code for resistors—26 different equations in all.

Budget

Use this SpeedCalc spreadsheet program to help you manage your own finances. Then send Gazette your own spreadsheet templates. We'll pay \$100 for each program we use. See "64/128 View" on page G-1 for details.

Get the February Gazette Disk for only \$9.95 plus \$2.00 shipping and handling. Send your order to Gazette Disk, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

TYPING AIDS

MLX, our machine language entry program for the 64 and 128, is a utility that helps you type in Gazette machine language programs without making mistakes. To make room for more programs, we no longer include this labor-saving utility in every issue, but it can be found on each Gazette Disk and is printed in all issues of Gazette through June 1990.

We'll send you a free printed copy if you send an SASE to Typing Aids, COMPUTE's Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.